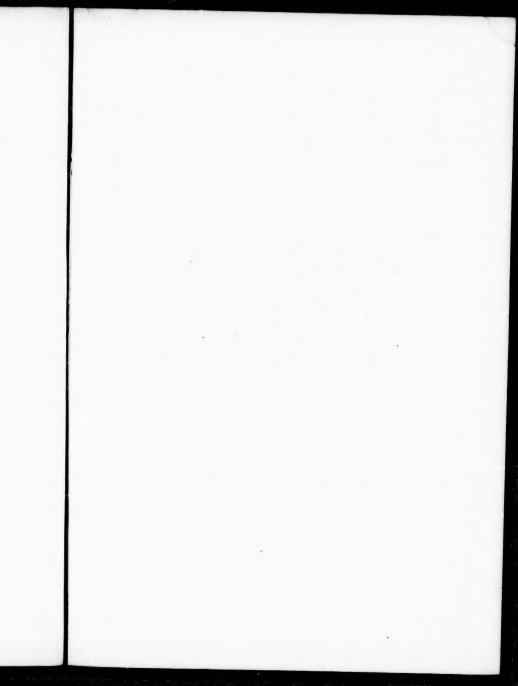


MY CIRCULAR NOTES.







JAPANESE GIRL AND UMBRELLA AT MAIBORO.

# MY CIRCULAR NOTES.

EXTRACTS FROM JOURNALS, LETTERS SENT HOME.
GEOLOGICAL AND OTHER NOTES,
WRITTEN WHILE TRAVELLING
WESTWARDS

## ROUND THE WORLD,

FROM JULY 6, 1874, TO JULY 6, 1875.

BY

## J. F. CAMPBELL.

AUTHOR OF "FROST AND FIRE."

IN TWO VOLUMES.-VOL. II.

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1876.

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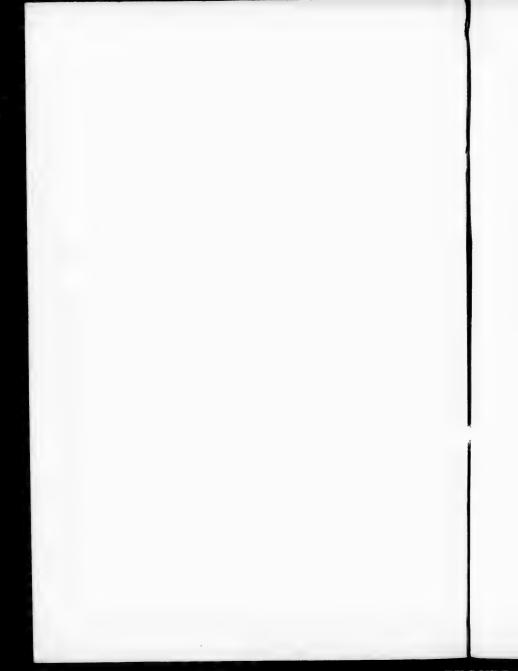
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## MY CIRCULAR NOTES-1875.

"Here's to the year that's awa'."

Friday, January 1, 1875.—Nojiri, 28° inside, 26° outside, 28.000; snowing, blowing, and misty; 2.800 feet above Tokio by estimate. Last night grand bells tolled, children sang about the streets, cocks crowed at all hours, and I dreamed hard, because they awoke me, I suppose. N.B. Not one of these dreams has come to pass in 1875. I note the fact, December 24, because I have been bothered all my life to believe in dreams, and cannot do it to please anybody. Started at 8.30. At 10, in a side-burn, found rocks bare, with the strike N.S. and the dip West. It seems that these rocks are not folded in any particular direction, but crumpled. Passed a mile-post 55 Ri to Kioto, 75 to Tokio; 130 Ri = 325 miles;  $187\frac{1}{2} \text{ miles done}$ ,  $137\frac{1}{2} \text{ to do.}$ A grand old stone Buddha stood by the burn side, with a crown and epaulettes, and a muff of snow on. He stood upon three steps under a tall, dark-green pine-tree, with the white road winding below him, and a bridge in the foreground.

VOL. II.

At Midono got some New Year cakes in hot broth, and watched the proceedings in the kitchen; 28:350, down 350 feet, upon bad slippery roads. I sat at the door of a teahouse, with my feet in the square hole with the usual fire in it. All the children were smart with red top-knots in their black hair, and with glittering sham flowers stuck about their heads. The streets were hung with flags, most of the same pattern, and dressed with bamboos, pines, and paper. About noon the sun came out, and the rest of the day was fine and warm. At 12.30 reached Mamone: 28.400, 400 feet down. Here the big river takes a swing westward, and the road goes up a branch stream. In it gangs of lumberers were busy shooting logs down slides and through dams. They were very picturesque and wild, and very Japanese. Here is another contrivance common to all northern mountain countries where men fell trees and use them. The Japanese are so ant to learn, that some engineer of ancient or modern times may have taught them this amongst other arts, but if they have learned from foreigners, they have adapted their learning to their own land, I walked up 1,200 feet in 34 miles, to 27.200 = 3,600 feet above Tokio. From the main river to the top of the pass the whole burn was turned into a slide for logs. A number of logs were laid together in the bed of the stream so as to make a curved trough sloping at a considerable angle, and a dam in the watercourse. At the top and bottom was a pool, and the logs were wetted by the stream. A lot of men guided a log through the pool, and launched it on the slide by hauling with poles shod with iron. The log rushed down and plunged headlong into the next pool, to rise amongst those which had taken the leap  $_{\rm nd}$ 

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earlier. Another gang guided the logs to the next slide. So for the whole distance, this deep steep gulch rang and resounded with the deep-toned musical notes which come out of logs when they jostle and strike hard blows in water. There must have been many hundreds of these fellows at work, and a great forest was going off to the river, to be floated to the sea in rafts, and to be transported to Tokio. I was told that the timber was to be used in rebuilding the Mikado's burned palace, of which I saw the foundation stones in the heart of the castle. I got to the top in an hour and a half on slippery trodden snow. The lumberers clustered about fires of aromatic chips, were exceedingly picturesque, and very wild-looking, strong wiry little mountaineers. I know that I was a strange being in their eyes, possibly I was hateful. They hardly troubled themselves to look my way, but when I gave them the salutation "Ohio," they answered politely, and went on boiling their rice or shunting their logs. In the Alps, in Norway, in America, and elsewhere, I have seen many timber slides, but none quite like this. It was a new species. On the top of this "Tonge," looked out over a distant plain with hills to the right, pointing my western way; and with tall dark hills to the left in the eastern corner of Japan. It was a magnificent view, but it was too cold to admire it. We trotted to a Tchaya near the top of the Tonge, and got some rice and tea from an old lady, who charged three farthings a head. Then we tritted down-hill to a picturesque village, with a long steep street facing the There I sat in a porch and sunned myself setting sun. while Massanao and the post people got a fresh pony. The

difficulty is that nobody wants to travel or work on New Year's Day, so they have to be bribed.

All this day we have been meeting parties going out to visit their friends, in their best clothes, young men and old, women and girls, all laughing and out on a spree, as they used to be in the Highlands of Scotland on this same festival of the New Year. Some were slightly elevated with sake, and the evening was to end with music and more sake, and a general lark. I insisted on tipping my men for sympathy; not a cross word or a sour face did I see on this Japanese holiday. The sunset effects were beautiful to the eye, and pleasant to enjoy, but horrible to the feet. The whole road on this southern slope, was a quagmire of mud and snow. I ran down as fast as I could trot to save daylight, and washed my feet at a door in the dark, at 5 by my watch; 29.000. We had got down 1,000 feet since morning, to a big river, and to a large town-171 miles; 140 on foot, since I got to the hills. The river which I left went to the west—I left it on the right. large river which I got to came from the west, and from the right. I thought it must be the same stream. I found afterwards that it drains a tract round which the big river sweeps westwards, to turn southwards to the Pacific a long way further on.

Saturday, January 2, 1875.—Utchiai. I had found my way into a magnificent tea-house. The sliding doors of my sleeping-place four in number were adorned with four excellent pictures of falcons, life size. They are the best that I have seen. In every Japanese room is a sacred corner where pictures are hung and where cakes are offered to the house kami. I am the

proprietor of a Highland house brownie myself, who used to have his offerings. Over my Japanese sacred corner hung a famous picture of a quail, or his Japanese brother, with his mouth open. Beneath that roll picture was a small table with a clean sheet of fine white paper spread on it. Thereon were placed two holy white cakes of rice-flour, with an orange on each, and a light burning, and some rice in a cup for the house kami. At the door stood the arms and armour of the grandfather of my host. The suit was beautiful; made of silk twist and plates of steel, and chain armour. Helmet and all, it was set up on a stand in the porch with an offering of riceeakes in i.ont. The house seemed endless, and used to be a Daimio's haunt in the days when Daimio's moved in solemn procession from their provinces to Tokio, along this Nakasendo, or middle mountain road. I was told of a Yankee who passed this way, with five eagos, three servants, a wife, and fifty coolies to carry him and his following and his provisions. He was the last notable lodger. I have been often mistaken for him along the road, and saluted as a friend of distinction, in spite of my humble equipage. I have heard of another American who was a tradesman, I think a clockmaker, who walked alone. In crossing the Uada Tonge, he slipped off the trodden path into a snow wreath, fell and stuck fast. A Japanese traveller found him, and tried to pull'him out, but he was too heavy. More came, and finally the traveller was set on his legs, and got safe out of his diffi-These are the only two foreigners who have passed this way for years, so far as I can learn. Last night the whole family came in to see me write up my log. I stopped and showed them all my pictures, and all the foreign curios

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are the that my pockets contained, watch, knives, instruments and money. With a very few Japanese words we spent a very pleasant evening, till I bade them "Saianara." I first put on the deer skin pesk, hood and all. Then, with much giggling and pretty speeches, the whole family slid out through a sliding door, and I rolled on the floor and slept among the falcons, and quails and holy cakes, and altar lights, protected by the kami. Even my own brownie failed to awake me. I suppose that this house could have lodged a hundred men easily. The sword racks showed the guests who used to haunt the house before the revolution.

Start 8.30 a.m., 35° inside, 32° outside; 29°000. Walked up 200 feet, then down and up as much; then down to a long straight town, in a plain, all swept and garnished, and hung with flags. The evergreens were set as usual in small mounds of sand. Every man, woman, and child in this region and, as I am told, in all other regions in Japan has done something for the decoration of some favourite place, and has made some offering to some kami or Buddha or Buddhist saint. It is a uational festival, and I have the luck to see it where foreign vays have not yet crept in. The only foreign influence is in he date. Since the revolution they have given up "Old Style" and taken up the new. Not to be Christians their day of ret is Saturday, in other respects their dates are made European.

Walked through the town with *Kasengi* mountain to the right front. Here the country changes to volcanic ash, with ridges of rolled pebbles, resting upon granite, some of the beds which I took for volcanic ash at a distance, I now suspect to be kaolin, the *débris* of decomposed granite. We

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passed a china factory where I bought a sake bottle for 13d. It was a sample of be witful ware. At 1, halted for tiffin after nine miles and a half of up-and-down road. Then went over the thirteen tonge stage of which I have heard a great deal. The strike was N.W. S.E., dip S.W., rock gneiss. The surface was shingle and clay with beds of pummice, and bare yellow banks of clay, all cut into deep ravines by running water. A railway bank after heavy rain will give a fair idea of this Southern Pacific slope. The country reminded me of Scotland with its brown hills, green pines, and yellow bamboo grass. The view looking back towards the high hills was magnificent. The whole land was deeply scored with ravines all of one V pattern, and the evening light brought out the forms in colour. At 4, sat me down on the grass and sunned myself. Rice was bearded in the fields, birds were twittering in the trees, water was purling in the brook beside me. It was a still, quiet, beautiful warm evening without a sign of the winter which I left in the morning. 48° on the grass. At sunset made Kangaia, washed my feet, and camped in a new tea-house, as clean as a new pin. All manner of quaint devices hung about the room. I noticed an offering to the well, whose god is *Ido kami*, and other offerings in strange positions. The sacred corner, the place of honour for hanging pictures, is to be called To ko no ma. There is the household altar, Kami Tana—god's shelf. Walked fifteen miles, 29.050. This westward route along the base of a range of mountain passes over a series of ravines cut by streams, and their dividing ranges make the "Tonges."

Sunday 3rd.—Made a late start at 9, 37° inside, 39° out; 29°050. Fine, cloudy. After a while it began to snow, then

cleared up for the rest of the day. Passed over granite ridges in which the stone weathers into great round blocks. Suspected ice-work, and hunted till I found out the cause to be weathering, or old sea-work. The dales were full of decomposed granite sands which make raw bare scaurs amongst the rich green shrubbery. The vegetation was beautiful. I made a rubbing of a fern leaf which I had never seen before. The plant grows like a star. All manner of shrubs which I have seen in greenhouses flourish on these Southern Pacific slopes, and feathers of bamboo rise high amongst the shrubbery. Green pines with red stems abound, and generally the day's walk was very interesting. I longed for a botanist to teach me the knowledge which every traveller ought to have, and I lack, worse luck. Stopped at a pretty village to drink tea, dozens of girls and children came to see me feed. I asked one pretty girl to come to England. The news of the proposal was carried to her father over the way at once. I believe they thought my intentions honourable. Papa laughed a loud horse laugh. I bade them "Saianara," and went my way. Passed a shrine with thirty-three Koshiri carved on granite blocks, each about two feet high. They were ranged in rows on shelves, some were coloured, some had four arms, some wore mitres, some had curious head gear, and some were exactly like mediaval Romish saints in vestments, with glories. Beyond the fact that they were "koshiri," I could get no information about these personages. So far as I could judge they seemed to be representatives of the idols of many a pantheon, all turned into disciples of Buddha, or Shinto kami. I gave it up. "No sabe."

Stopped early at 1.30, eight miles and a half; got some food

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and then sat at the door to sketch, and catch curious creatures. First children, and then men and women and girls, then grandfathers in spectacles, gathered to see the stranger work at his art. They understood all about it directly; little boys got in the way, and being instructed got out of it. All were civil and polite, and full of fun. The game got to be to holloa and shout at any new awkward arrival who ignorantly got in the line of sight. At last I tired of the town and the bamboos, and took to drawing faces and figures. Long experience has taught me that few people care about landscapes and architecture, but that figures and caricatures suit all tastes. The crowd closed right round me, and yelled and capered. "That's Tora!" "That's Otame." "Kuri," somebody else. "Heh!" said I, "kuri Tora," yes, that's Tiger. Then everybody pointed at Tiger, who grinned like a Cheshire cat.

Otame blushed, for she was very pretty and knew it. At last I got tired of them and went for a walk, followed by a cheerful tail of merry children. We made a pilgrimage and procession to a temple on a hillock, and there found an old man lighting candles at shrines, and in stone lanterns. The stone images in vestments and the candles of ritualists at the shrine of Buddha, on Sunday evening! "No sabe." I gave it up, and walked down the hill as wise as I was before I went up. I walked solemnly through the town followed by my cheerful tail, yelling and capering; cocks and hens fled, cackling before us, and a regular scrimmage was everywhere.

The crowning joke was when I mixed all the clogs and sandals at the tea-house door with my stick. Then this Togin Bashi, or Chinese fool, said "Saianara," drew his sliding door, and vanished like the clown in a pantomime, to dine,

If any foreigner would like to try that little game in England, I think we could promise him a broken head, or a mud baptism. Not one rude act did I extract from all these merry Japs. Two merchants presently appeared with curiosities for sale. They had magnificent crystal balls, pictures, swords, and knife handles, said to be gold, but manifest brass. I invited them to my room, and with Massanao, had a long talk, but no deal. I had bought a curious old book for a trifle at a shop by the wayside. It cost sixpence, I think. A man followed us, and asked if I had really bought that book. My squire said certainly. "I have been trying to buy that book for a very long time," said the collector, "but it was too dear, and the shopkeeper would not cheapen it." Then as he was much grieved, he laughed and trotted off down a side road. The news of this magnificent purchase spread, and the merchants followed many miles. I had not got enough of Japanese money to be able to spend a hundred dollars on crystal balls, but they were the finest I saw in Japan, and well worth the money to a medium or a merchant. As to kami: At one door I saw three saddles, one of straw, one pack-saddle, and one gorgeous with lacquer, gilding and red leather. In front of them were two holy cakes, and an orange. This was more than curiosity could endure, so Massanao was cornered and made to explain. He said:--"That man live by horses, so he offers a cake to the kami for custom in the new year. A merchant offers a cake beside his book, a shopkeeper by his goods."

Accordingly, in fact, every shop had a couple of votive cakes and an orange placed amongst the goods, just like our grocers and butchers, who put holly and laurel on their nd.

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wares. "A soldier offers a cake for his sword, and one for each weapon of war—bow, arrows, spear, and so on. A householder offers for his fire and well, and for each part of his house." That is all very fine, but I could not find out then, and I have never found out since then, whether there are as many kumi as objects and places, in respect of which offerings are made, like patron saints; or whether some special divinity is propitiated with cakes and oranges for the benefit of the vendor of provender, or of the soldier who rips up the eater, or whether all the offerings are made to one kami of the season, or to one God.

The people in this house objected to have my venison cooked at their fire. It was unlucky, or it was wicked, or unclean according to their faith. They had no objection to cooking birds. Accordingly an old cock bound with a straw rope, was brought for sale, and execution. He was released as too tough and too dear. A chicken and some redwings were substituted. I dined and wrote up the log of a curious day by my candle on the floor.

Monday, January 4.—Hosukthe. 32° inside, 30° out; 28·600 = about 2,200 feet above the sea. Bought a lot of queer things. The crystal balls are said to be worth twenty dollars each in the place. They have double refraction, and are very fine stones. The crystal is got on Carry's Road to the east, and is there worked as it is at the chief towns. These ornaments are to be placed in the sacred corner on state occasions. I wanted small portable samples of Japanese art not precious stones; so after more talk I left these curios for future travellers. As merchandize I might have made a good thing, I believe,

Started 9.25; one curious feature in the landscape hereabouts is the rice-field. The bottom of every glen is banked up, and the banked-up flat ground is irrigated. Each little field becomes a mirror, dotted with rows of roots, and the curious curved steps and narrow patches make a fantastic mosaic, like shining tiles, or fish-scales set in the brown hills at the bottom of winding ravines. I was constantly reminded of a water-dragon couched in a glen. The roads were good, and in good order, and the air fresh. We walked merrily, Massanao on his native clogs, as he had worn out his European shoes. I walked fast, and the little squire held his place easily. To keep his toes warm, his feet were in pockets of fur, sold for that end at the shops. We stopped for Tiffin, and I amused the natives with a burning glass.

They are a most ingenious curious race. My old briar-root pipe excites great attention, and everybody wants to see how it is made. It is so vast in comparison to the Jap pipe, that they always laugh when the big pipe is filled. "Big man, big pipe," they say. Shoes also are great curiosities; mine certainly are, for they are nearly worn out. After ten and a half miles, we got to a station with jinrikishas, but walked on, three and a half miles in an hour. We got to a river, and there the clogs came to grief amongst the large stones. Horse and all we crossed the river in a boat. It was a grand stream, much grown since we parted a few days ago, and alive with boats of curious build, with high sterns. Many were sailing and punting up stream. This day, at about the usual level, we passed more banks of shingle. I suspect an old sea-margin along the base of the Pacific slope, between hill and plain. At the river the rock was a kind of induere-

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rated, stratified clay. Strike N.E.; S.W. dip; S.E. towards the sea. Halted in a large river-side town, where was a grand shindy out on the shingle-beach. They were celebrating the launch of a new boat. "All the children get cakes; all the young men get drunk on sake," says Massanao, There must have been a hundred of them at least, all in blue as usual. The New-Year festival ends to-day. All the evergreens are down, and chopped up for fire-wood. we meet groups of lads and men going on the spree in pattens. I have not seen one drunk yet, nor heard a cross word spoken since I started. I have not met with an uncivil act. I have seen strange sights; but I don't care.1 The vegetation this day was very rich in evergreen shrubs. Camellias and other flowering plants were numerous in the brushwood. The shops were full of dried persimmons and excellent oranges. Mine hostess here again objected to the cooking of venison at her fire. She further objected strongly to my unclean presence in the kitchen, as I afterwards discovered. My squire got up a private fire in the veranda, and together we cooked. As people ask often how men fare in Japan, this was the feast :- Venison, potatoes, onions, rice, and carrots, made into "hodge-podge." Fresh fried fish, an omelette, a sugar-cake from Asamayana, dried persimmons,

<sup>1</sup> These proof sheets came to me after a year, at the same season in 1875-6. Resemblances between New-Year festivities in Britain and Japan once more strike me as very remarkable. The paying of bills, and visits, the giving of gifts, the feasting and drinking, the singing and dancing and dressing, the decoration of homes and holy places, the holiday, the tolling of bells, the crackers, the midnight singing, and many other small matters that belong to "Old Father Christmas," are being enacted over the way by Japs and Chinese. Even "Christmas cards" are but modified Chinese civilities.

oranges, tea, and one solitary biscuit, a gift from the stores of Carry. There was not a bit of bread within a hundred miles. All were excellent in their way; so men need not starve in Japan. Walked fifteen miles, 30·300; down 1700 feet from last halt, 500 feet above the sea. Here begins the shelving Pacific plain, with high snowy mountains to the right, the back-bone of Japan, reaching as far as I can see westwards to the north of my route. Down the river is the third largest town in Japan, with a five-story stone eastle in it, from which was taken a great golden fish monster, which is now in the Tokio museum. The Tokaido, or east-coast road, passes through this town. I stick to my own road, on which I have walked 178 miles.

Tuesday, Jan. 5th.—Otà, 37° inside, 32° outside 30.400 rising Say 400 feet above the sea. The people thought me a wild savage for cooking venison in January. We had to wait for a horse, so I walked to the river and watched men shooting the rapids on small rafts and in small boats, a tail of children followed as usual. At last I set off alone, and wandered along the river-side admiring. When the baggage pony came we set off down a gorge where the rocks are flinty quartz in thin beds greatly contorted. Strike N.W., S.E., after passing a col we came to red sandstone, but found no fossils. The people met on this march were chiefly picturesque gangs of watermen carrying oars, steering-paddles, ropes, and such like gear. They had been down the rapids with small rafts, and they were going back, to lead more timber through the big river to the great sea. Their work was part of the foresters' industry which was going on further up. At this rate the forests will soon be exhausted, for the hills are not thickly clad.

At the gorge is a beautiful little shrine in a small cave. I went up the stone steps and drank tea and rested, with a vendor of cakes. A countryman came in and threw some cash into the usual grated box. Then he squatted on his heels and prayed to Buddha, rubbing his palms. Then he got up and spat, and came to drink tea and eat cakes. This is the first praying man that I have seen in Japan, so I note his proceedings. He had no objection to my heretical presence; we had our sociable cup of tea and chatted pleasantly. It seems that my unholy appetite for venison is the unclean side of my foreign character in the eyes of orthodox Buddhists, who prevail in this region. "They know nothing at all; they are old-fashioned people," said my squire. Went down the stone steps and found the usual stone rail, not built, but deliberately hewn out of the solid to imitate a plain wooden rail. The Japanese are famous carpenters, and their masonry and stonework is all in imitation of woodwork. The rock carving is a striking illustration of that fact. When we left the river and mounted the col, we looked over the plain at last. We got down to a village and ate boiled fish and rice. The wife did not clean her fish because I was to get some medicine inside, vicarious diet of worms is the custom. A fish-bone stuck in my throat, the sympathizing hostess bade me put the fish's head on my head to cure me; I preferred to swallow a lump of rice, but I learned something about Japanese surgery.

We had got to jinrikishas after  $184\frac{1}{2}$  miles on foot. The manager of the service made a bargain, and beat a big drum thrice to warn three athletes to prepare. When they were ready we started on wheels. We drove over a moor studded with pines and bamboo, in a snell wind for ten miles. I meant

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the ad. to go on, but as some fair was up, no men could be got, so halted at half-past three at  $Kan\delta$ . This was a long town in which was a Daimio's castle, which was pulled down. At the gate I spied a curio shop, so I bought. In the evening men came with more goods for sale, and we spent a pleasant evening round a shibashi. I was greatly tempted by the Daimio's saddle. It was all gold and red and lacquer. The stirrups were iron inlaid with silver, and real works of art. The merchants promised to bring more goods if I would wait. So as there is no particular reason for going, I stopped.

Wednesday, 6th.—Kand. Camped in a quiet little tea-house in the main street with quiet friendly people, who gave me a neat little band-box of a room opening on a small back garden, where the sun shone. The front of the house is a kind of eating shop, where viands are stowed in vessels for 40° inside, 30.550, about 250 feet above the sea. Bright and sunny. Spent the morning in packing purchases. and in writing with doors and windows open. After a while came the merchant, who led me a mile to a big house, whose owner, a merchant, had lost heavily in rice speculations, and wanted to sell all his rich possessions. He was at home, and gave us tea and cakes. The house was within a moat and rampart, built of earth and rolled stones. We entered by a gate, over which hung curious weapons with hooks and spikes on a long pole. These, it was explained, were intended to roll up in the long sleeves of enemies who might attack the castle, and so overpower them. A side door let us into a dark passage, where clogs and boots were left. My friend the merchant came in; two others, who had been playing ambassadors all morning, stayed outside. We entered

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een red a Japanese room of the usual kind, but with some desks and globes, and European gear in it. We sat on small Persian carpets spread on the mats about the shibashi, till our host The rich merchant evidently aped the Daimio in his house, but his dress was the usual Japanese costume. He came in and smoked, and conversed with my squire, who being a Samurai, had all the manners of a polite gentleman, and lots of small talk. I sat and smoked gravely, drank my tea, and now and then picked up a sugar-plum with chopsticks, and made shift to pop it decorously into my mouth. Mine host said that he had several "godowns" full of gear; unfortunately two officers of the government had arrived as guests, and he could not show me his goods. I was sorry for the poor fellow, and sorry for myself, as I hoped to see what a rich merchant considered to be worth collecting. I made my best bow, which had begun to assume Japanese proportions; and then we all walked back to the town and fed. For the rest of the day I held a levee of vendors of curiosities. They came in and sat and smoked, and produced wares of great value-gold, and knife-hilts, and porcelain, and embroidered dresses, lacquer-ware, bronzes, and pictures. I bought some and bargained for more. Had I but known the value put on such things at home, I might have made my friends happy. There was a blue satin dress, embroidered with life-size brown lobsters in silk; a blue satin wedding dress with trailing skirts, on which were embroidered, in silk and gold thread, an old man and an old woman. was sweeping, the other raking autumn leaves. The idea expressed seemed to be long life and a pleasant old age. "They wear when glad; live long time," said Massanao. VOL, II,

There were many other grand dresses, but these were the best. The figures really were works of art, pictures in thread equal to anything of the kind that I have seen in Europe; better than anything that has been done in the School of Art, so far as I can venture to judge.

I only saw one bit of Japanese embroidery to equal the That belongs to a friend in Tokio, who found it in a shop where old rusty iron was the chief merchandize. It represented the legend of the arrival of their ancestors in Japan. They were in their boat bringing the favourite products of the country. One had the "Tai," which is the favourite sca-fish; another had a deer, another a falcon, and all the rest of the patriarchs held their different properties, and were dressed in the mythical clothes. The faces were characteristic, with varied expression, and the action was good. The needlework followed the drawing, like the lines of an engraving. That was the best bit of needlework that I ever saw anywhere. My Kanò figures were nearly as good. I bought in Tokio an old dress for 1s. 3d. A lady at home valued it at 8l. to 10l. This dress was worth a dozen of it, to my mind. One of the pictures was a roll which reached to the outer door of the second room. About a hundred highly finished miniatures represented a play at court. It was very curious, for obsolete Japanese costume. I bid for the lot, but missed it. My travelling purse of Japanese paper money was slender, and English gold was worthless in Kano. Even after I had gone to bed, men came with goods to sell. These were the spoils of the Daimios' town; possibly some of the properties of the ruined merchant who bought them, possibly some of the properties of a theatre which was close at hand. With time and money

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I might have furnished a museum. As it was, I learned a good deal about Japanese art. The shop was a queer place, hung about with Daimios' luxuries: lacquer-ware luncheon boxes, ink stones, and boxes of sorts. I went into the back premises, and box after box was unpacked with the utmost good humour. Ancient Chinese plates and dishes, and Japanese ware with marks, which my man could read. Red lacquer Chinese tables, horse trappings, arms, armour, swords, spears, roll pictures, carvings, buttons. Out they came till I was puzzled how to fit my purse to the temptation. I did not know how to carry them, or pay for them, or what to do with them all if they were mine, so I bought some things which pleased me most and departed. A swell in European clothes had been riding about on a good horse, on a grand saddle fit for a Mikado. As I went away from the back shop I saw the horse being groomed. A man in a waist-cloth was washing the steed all over with hot water, and the brute seemed to enjoy the bath as much as the man. They made a grand picture in a cloud of steam which rose from a tub, and from the horse's hide. When I got home I dressed my landlady in the wedding-dress, and the worthy matron posed as the Japanese lady who appears on porcelain.

ART.—I have now been hunting for objects of art for a good while, and my knowledge may be of use to purchasers. A great many cabinets are preserved as Japanese in England. I know that some are Japanese, for they were sent as gifts by the Japanese government, and they are preserved in English palaces. Others were brought home by sailors and merchants, and are preserved in the houses of their descendants. All these may be genuine old Japanese furniture.

because I find pictures of such things in old books, but I suspect that most of them were made for exportation, because I never saw such an article of furniture in a Japanese house.

There is no furniture in use there now, except the "shibashi." That is a contrivance made of wood, or china, or brass, or bronze, to hold fire. It is carried about the house or stands in the porch, and people sit about it on the floor warming their fingers, and lighting their tiny pipes, conversing, writing, working, or idling, from morning to night in cold weather. The shibashi is the commonest article of furniture in Japan, but I have never seen one in England. A great deal of good art is expended on the decoration of these fire boxes.

I seldom saw porcelain plates or dishes used at meals. Fish and eatables are commonly exposed for sale on such dishes, and many of them are beautiful. Sweet-meats, and sugar-plums and dried fruits, sometimes, but very rarely, appear on porcelain. The dinner service which came to me was always lacquer. The foundation of the cup, or bowl, or rice-box is wood, admirably turned. The lacquer is laid on with a brush, and is often decorated with figures of birds, tortoises, cranes, falcons, and other such designs in gold or colours. The varnish stands heat, so that soups and such-like appear in lacquer cups with a cover. Fish are served in lacquer trays, rice appears in a box with a cover. Meat appears in the iron vessel which cooked it. Each guest has a small tray-table of lacquered or varnished wood, on legs about three inches high, on which the dinner is arranged, with new chopsticks. Knives never appear; spoons are so rare that I bought one of porcelain for my own use. The fashion

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is to drink the soup out of the lacquer cup, which is a bad conductor of heat, and does not burn the lips. In some districts a clam shell neatly rivetted on a slip of bamboo is the cooking spoon.

I saw no such thing as a Japanese chair, or stool, or bedstead. A good deal of art is bestowed on short-legged tables for reading or for writing. The inkstone, and pen-rest, and box for papers, are articles of luxury. I never saw one of these out of Japan, but I saw a great many there, of which some were inlaid with gold plates. The foundation is wood and lacquer.

The Daimio's luncheon equipage is another article which is now commonly offered for sale. It consists of a lacquered box with trays and shelves, and a place for the sake bottle, which is porcelain. Sake is heated in boiling water, and drank from small porcelain cups. I have never seen one of these boxes out of Japan. The ornamental box goes into a plain case, and the whole is slung on a pole. The fashion was to go to a hill, or a fall, or to some other pretty country place, eat, and drink, and smoke there, and write verses. Each Daimio had his painter, and his retinue and the retainers ornamented the equipage. The norimon in particular was a grand conveyance, in which the great men were carried.

Lacquer is a substance extracted from a tree. It grows in the north of Japan, and the gum is prepared and sent to all parts of the country. It is a rank poison while soft. Many people cannot endure the smell, or pass a workshop without suffering. A great deal of skill is required in making the gum harden and set. When set it is waterproof and perfectly

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harmless; it stands heat, and is tough and hard. I got an English box lacquered inside and out, and it has stood rough work right well. Wood, metal, leather, paper, and fabrics take lacquer easily.

Arms and armour were the chief ornaments on which art was lavished. Fancy prices were paid for sword blades. Marks of famous makers were prized and paid for. The hilts were adorned with gold, and the iron mountings were inlaid with all the metals and amalgams known to the armourers. Some of the best samples of Japanese art that I saw were on arms and armour.

Wood-carving is excellent; I have seen few samples out of Japan. The best are about temples of course, but every good house has something carved in wood as decoration. One common ornament is a plank of hard wood placed above the sliding paper walls of a room, and cut through, so that light makes a picture from within, and darkness from without. It is either a picture in white on a shadow ground, or a picture in black lines on the brown wood. Fuji San and clouds, a water-fall and foliage, or a stormy sea and hills, are common subjects. I never found one of these for sale. They are in fact part of the house.

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Small carvings in horn, bone, wood, and ivory, peach-stones and cherry-stones show the skill and taste of the artists. I gathered a small collection of buttons which are passed through the waist cloth, and support the pipe and purse, and baccy bag, which dangle from the waist of every Jap like the chatelaine of a modern lady or ancient housekeeper. Many of these buttons are real works of art, expressing a wealth of meaning, imagination, and thought; e.g. on the base of a stag's

horn is carved a death's head, with a lotus growing out of the jaws. It is the Buddhist emblem of *Resurgam*.

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I never saw a bronze vase in a house. The shops at Yokohama are full of them, but they are modern. The handles do not lift the vase, but hang on pegs of bronze. All the bronzes that I saw in use were about temples and shrines. They have a peculiar style, and their handles belong to them. They are in sets, and are used in ceremonies. One is for holding flowers, another for burning joss sticks, a third for a light. A great many small altar bronzes of this pattern were exposed for sale, probably because Buddhism is out of fashion. I bought those which I could carry, and which struck my fancy. The modern bronzes are good works of art, and Japanese, but modern inventions.

Great numbers of large china vases are made and sold in the treaty ports. I do not remember to have seen one used in the country.

No ornaments are worn by men or women. The only bit of gold work fit for an ornament that I saw was a pen-rest in the shape of a sprig of May flower, with coral knobs stuck on the gold. The women all wear a single comb, and a few hair-pins, with coral heads. One class wear a whole sheaf of tortoise-shell pins sticking out like the rays of the sun on a signboard. The Japanese sun is a woman.

No Japanese jewellery came under my notice; I believe that none ever has been worn. They have taken to making ornaments of rock crystal for the foreign market. The artists who made my gold pen-rest, and who model bronzes, and inlay metals, are capable of making beautiful work.

The pictures are peculiar. The most of them are long rolls,

which hang from the top of the room in the sacred corner. The artists seem to have sketched, with a very free hand, anything that they happened to think of. Fuji San represented by half a dozen strokes of the brush, a cloud expressed by certain conventional curves, a dragon indicated by a few sempentine touches, beginning in a cloud and ending in a flourisher such are the common subjects of house-pictures. These are commonly stamped with the artist's seal, and signed and dated. They are carefully and skilfully mounted, and the roller is often tipped with ivory. The roll goes into a neat box, and there it remains till the time for showing pictures comes round. Others are long rolls, which cannot be exhibited on the walls. They must be shown on the floor. Some represent birds, which are very well drawn. I got a falcon series at land, which is a work of art by an expert in falconry. I was shown many roll-pictures, some of great age, but they did not tempt me. Instead of pictures, quotations from poets and other inscriptions are commonly made into rolls for ornamenting rooms. Some caricatures have quotations written under or beside them. The best pictures that I saw were pasted on the sliding doors of good tea-houses.

Temple decorations, and decorations for small shrines, vary chiefly in size and excellence and age. Their style is the same.

In all the decorative art of Japan that I saw, that which struck me most was the firm touch and accuracy of the work, and the sense of fun and life and expression that pervades it all. The fun is the expression of the genius of the people. The life and expression prove their artistic skill. They are always laughing, and always apt to take a joke or make one. The

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accuracy of hand probably results from the difficulty of writing. From childhood everybody is taught to use the brush in making their complicated characters. There must be no mistake. Every touch, and dot, and tail, and flourish in a Chinese character has a meaning. Every letter is a kind of picture, so children draw accurately, and men go on drawing all their lives. So when some artist contrives to imitate a bird, or a leaf, or a flower, he can go on repeating his design as often as he pleases, touch for touch. It is but another kind of writing. The habit extends to all other sorts of design. Those who paint plates, those who carve wood, those who model for castings, those who work in metals, all are taught to make their hands express their thoughts by complicated forms, and so they express them artistically. even with needles and thread. The first Japanese picture in oils was painted while I was in the country. If these artists will only keep to their own inventions, they may start a new and excellent school of art in any age.

Whether any foreign influence is to be traced in ancient Japanese art or not is a question which needs more knowledge than I have acquired. About Nikko there certainly are samples of European art. The Greek key ornament appears on many Japanese bronzes; many of the older shapes are related to Etruscan forms, but they are more nearly related to Chinese art. Where a whole people take up and adopt a new idea in a few years, a single foreign object might influence national art in any age.

Nowadays, foreign influence is at work in strange ways. An old cracked German plate was brought to me as a very precious antique, worth large moneys. A very elaborate

bit of inlaid work is shaped on the lines of a wash-hand basin of truly British ugliness. A glittering pattern in a dark shop caught my eye at Shimonoshua. I went in, and found to name of a firm of clothworkers worked into the end of a roll of cloth in threads of gold. Soon after I saw a coolie with this same kind of border worn as the chief ornament of his herald's tabard coat. I asked and learned that the decoration had become fashionable, and that Messrs. Heddles, Treddles, and Co., had manufactured cloths with their distinguished names worked in gold at the end for the Japanese market, and had made much profit by their 'cuteness. Those who adopt anything foreign now may have acquired some of their art from abroad of old. But here in Japanese art is one more clue to the common origin of people who live at the opposite ends of the old world. There certainly is something like an Etruscan element in some Japanese art, however it got there.

The Japanese have an eye for colour as well as form. Their paintings on porcelain prove it; their damask silks are beautiful, and their embroidery is better than Chinese in all that relates to harmony of colour. So I thought at Kanò after a long day's shopping, and a good deal of wandering and watching objects of art.

Thursday, Jan. 7th.—31° inside and out. The merchants came, but I was in a hurry and would not wait to chaffer. Bill for two men for two days, 3s. With three jinrikishas, and two men to each, drove seventeen miles and a half at the rate of four miles and a half per hour, including stoppages to eat, and two ferries at the cost of a little more than a penny a mile per man. Rose about 700 feet to Godo Kawa

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ferry. First stage on wheels, second on foot. Leaving the plains we passed through a cross range of waterworn snowy hills with high hills to the north. Halted at a village where it war not easy to get housed and fed. On the way passed an Aryas of some breed or other, but did not see him till he was too far for speech. A cold snell wind. A day of travelling without much to note. The quaintest part of the proceeding was to sit and feed and converse with my team of human ponies about a fire of sticks in a tea-house porch, and realize that the camp-fire is the first step to house-building. The carriages were as usual very well made, very light and easy. I doubt if a London builder could have made much better work. The body was lacquered, and the black varnish covered with pictures of crows in gold. They were very well Japs never design anything like the rest of the world. In other countries designers are apt to compose evenly, with something in the middle, and two somethings at each side to balance. Here five or six crows were scattered all over the carriages, so as to avoid uniformity; a crow was on the corner, half on the back, half on the side. The same habit of mind appears on tea-trays, and in houses; in temples, and in the chests of drawers which are made for exportation. The Japanese artist cannot abide uniformity, but somehow his design is always pleasing.

Friday, 8th.—Emdsu, 30·200. 42° inside, 33° in the garden; ground frozen, snow and icicles. I have passed a lot of soldiers in uniform, walking on the national clogs, on their return from the wars. They stop at the tea-houses, wash their feet at the door in hot water, and walk in quietly, like gentlemen. Last night a lot of drunken travellers wanted to

fight "with hands." The old woman of the house turned them out, and I knew nothing about it till my squire told me. The bill was 2s. 6d. My room was small as a tent, neat as a bandbox, with polished stained woodwork, and pierced pictures, and bamboo screens covered with paper. These made my walls and a partition between my layer and my squire's. One of the jinrikisha men offered venison, so we bought a shoulder for the larder. A German plate was produced as the best crockery. Yesterday a pewter kettle much battered was offered for sale as a great curiosity. Started at eight, and got to Maiboro. At 11.30, 30.500 on the shore of Biwa-ko, the lake Biwa, the largest in Japan. The road was a quagmire with stones in it; crowded with gangs of men, women, and children, cows and buffaloes, all carrying and hauling firewood or merchandize in back loads, or on poles, or on long cars with solid plank wheels. The loads moved by man power were enormous. The country was a maze of wooded ravines all of one pattern, each with a stream and paddy fields well cultivated and thickly peopled. An English Marine officer is quartered hereabouts. I had a letter to him, but the roads were in such a mess that I housed my goods and went out for a walk, instead of driving seven miles. I walked along the street and looked over the lake. This end is a bog with reeds and rice in it, and with a muddy creek full of large boats of queer rig and build. Mountains covered with snow surround the lake. The hills come down to the bog, and are made of stratified rocks greatly contorted, and very hard. The camellias are large trees, some in flower, all budding. Evergreen oaks, and grand straight pines, and various beautiful shrubs, and ferns, and bamboos, cover the hills which are

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JAPANESE LODGINGS, MAIBORO.

JAPANESE LODGINGS, MAIBORO.

all worn to the same  $\bigwedge$  pattern. There is not a sign of glaciation from here to Tokio.

Saturday, 9th,—Maiboro, Last night sketched my room, with mine host and his daughter looking at my pictures. Lots of travellers came in late, and got shampooed. drums and bells of a temple sounded, and generally my lodging was noisy. A litter of impudent puppies lived under the floor and made sallies into the muddy garden. It rained in the night, and poured in the morning. A pretty little girl in pattens carried part of my luggage to the steamer under an umbrella. 46° inside, 43° outside—30·100. The steamer, advertised for eight, started at 9.30. We made thirty-seven miles and a half, and got in before four. The mist hid the shores all day, but now and then it lifted to show villages, and towns at the side of the lake, at the foot of tall ranges of hills. Lake Biwa is said to be very beautiful. We passed some islands shaped like the hills and terraced, as if the lake level had fallen. The steamer was manned, engineered, and commanded by Japanese. I believe they made it themselves. The cabin was divided by a low rail. The first class sat on the floor about a shibashi; the second class, who were numerous, sat on the other side of the low rail, and we all smoked. One of the first class was a little Samurai official in the orthodox loose trousers of his genteel class, but with the modern fashionable mass of stiff black cropped hair, instead of the usual shaven crown, with short shiny pigtail folded up on top. My squire fraternised with the gentleman, till he went to sleep rocked by the billows. It was nearly dead calm but the soldier was unwell. Ot is a large town with wharves and steamers about them, and with paved streets and much mud. Our passengers donned their broad straw hats, shouldered their packages, and vanished into the streets. I followed a coolie and my box to a tea-house, and camped magnificently under the wall of a temple. Presently service began. Mara, mara, mara, mara, oi, oi, oi; mara, mara, mara; Drum, and then all manner of chanting and strange noises. Then in came mine host, so I stopped writing and held a palayer with the family.

Sunday, 10th.—Stopped and rested and dawdled, drew and smoked, and wrote home. Walked to a famous temple with my host, who is very civil to foreigners and anxious to learn their ways. The famous view was invisible for mist; so after looking at the temple and the town from a grand terrace, where "no" dances are performed on festivals, we wandered down and shopped. In fine weather this lake must be beautiful. Ot is a military station, and being near Kioto, on the main route, is a very busy, interesting place. If I had seen it a couple of months sooner I should have enjoyed it more. You who write journals be warned and write while things are new. All that I had to say about Ot went into a letter, which started by the usual post, and got safe home. My log is meagre. Bought some photographs of Midera, the famous temple of Kangwon, at Ot, which we went to see. A very few years will change all this country. The traffic now is enormous on the roads, converging on the steamer. Surveyors are out, selecting a route for a railway. I am fortunate in having seen Japan even as it now is, rapidly transforming itself with all the readiness of the native badger and the rest of the Kami, who are changing from gods to be nursery tales. A fellow-traveller tells me

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iy. is, he ng ne that he got within sight of this lake travelling from Kobe. He was charmed. One night he took a fancy for milk in his tea. The interpreter reported that the people were very sorry. They had no milk, but they had some hog's lard. Anything in tea is unknown, therefore anything might please the foreigner, and hog's lard, being foreign and unclean, might do as well as milk. I never heard of milk, butter, or cheese, away from settlements.

Sunday, January 10, 1875 .- Ot. The priests are at their evening prayers. At intervals they shout, "Buddha! Buddha! Yah! YAH! YAH!" And there is a gush of water. Massanao explains that they are dashing cold water over themselves, being naked, and that they do it for thirty days while it is hard frost. The ceremony began three days ago. In Tokio they used to run two miles out and in, and dash cold water over themselves. But now, as people must wear clothes in the capital, they cannot do it. Benten is a snake-lady; I have got an image of her. Mioken is another snake. A man became a woman, and the snake Mioken became a man, and came to the lady's room. What a wealth of stories Japanese mythology contains. My boy cannot speak English enough to explain it all, and no European that I know There go the priests again with a drum and a pail of water. They have been at it for an hour, "Tha! AI! THA!" Theirs is the so called "New Religion," which is a mixture of Shinto and Buddhism."

No. XXXII.

Sunday, January 10, 1875.
Ot. Lake Biwako, Japan.

MY DEAR MOTHER,

I have been twenty-eight days on the road from Tokio to Kioto which I mean to reach to-morrow. After that I have easy travelling to Kobi where I take ship again for China.

I am writing in my Archangel skin dress, with my feet wrapped in the hide of a Japanese goat, by the light of a candle stuck in a sake bottle. My room is made c... of paper screens, and the floor is made of mats, on which I have just dined. On the other side of a wall is a temple, and there service is going on. The priests have been jabbering for an hour. Now they are striking a grand bell; a while ago they were beating a drum. At short intervals they call vehemently on Buddah, BUDDAH—YAH! and then a gush of water means that they are dashing pailfuls over their naked bodies, because this is the season of frost. It is so wild and strange to sit here in the middle of Japan and listen to all these strange sounds, while a quiet civil Japanese is crouched beside me watching my pen. He has been with me to a temple where there is a grand view over the lake famed in all Japan, and we have been to curio shops and strange places. We cannot talk, but by the help of my interpreter we have grown friends.

I cannot tell how I enjoy this strange, wild life. Thanks to Sir Harry Parkes, I got leave to travel by the Nakasendo (middle mountain road) where few globe-trotters or Europeans have been. My road took me over passes 6,000 feet high

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into snow and hard frost. (Here comes my landlady and her children and a grown son, and there they all are looking at my picture-book.) I do not mind cold, and thanks to my Archangel dress I slept sound in a temperature of 29° inside my paper room. But when I set out I did not reckon on walking 200 miles on snow and ice, with occasional days of mud when the sun shone and I got low. I started with a game foot, but by dint of walking my soles are as hard as ever, and I am in glorious good condition again. I have not felt so well for years. I weighed but 238 pounds a while ago now I weigh 192. I carried no food of any kind, and I had no fork or spoon. I have seen no bread for six weeks, and I have learned to eat with chopsticks like a native. Japanese food is not bad; I get rice everywhere, shell-fish, eggs, and vegetables of many sorts, oranges and persimmons and cakes made of beans, and many other curious viands. When I find a pheasant in a shop I buy it, when I find venison and mountain goat I buy a joint, and my boy makes soup and stews steaks, and fries potatoes, and then I feast. Tea I drink all day long without sugar. When it is cold, and when I am in the humour, I put sake and orange-peel into the cup; sake is a wine made from rice, which I find excellent The Marchioness made believe in like and comforting. manner, and was as happy with Dick Swiveller. natives get drunk on sake; I do not, for I could drink a quart I believe. That being my fare. (Here comes an old woman with cakes to sell;—I have treated the family all round.) My habits have been to walk fourteen to sixteen miles a day, and stop a day or two when I found anything worth stopping for. I stopped at the foot of Asamayama, a volcano,

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and I did not go up because it was deeply covered with snow, and I am fifty-three. I stopped at Shimonoshua, where are hot springs. Opposite to my door I saw more naked people than ever I saw in the same time. A great steaming pool under a shed in the street was full all day, and most of the night. Men, women, and children of all sexes and sizes, ran in and out and splashed and played there, as if it were summer and dry. Sometimes a couple of them, stark naked, toddled off down the street under a paper umbrella to keep off the cold sleet which was falling fast. What they are all made of I cannot fancy. I was too cold-fingered to draw much, but I have made some sketches. My chief amusement has been buying curios. I have got a set of knife-handles, and no end of lacquer ware. To-day I bought five large plates for three shillings, and one very fine dish for four. "Fine old niddry" will be a fact when they get home—if ever. (Pause to smoke). I can buy suits of armour for a couple of dollars, and swords by the dozen for about a pound, the best. But I don't want armour, and I don't know who does. The temptation to buy is not to be resisted. I have got a golden pen-rest. I had nearly got two blue satin dresses embroidered in silk. One was all over brown lobsters, the other had two old figures sweeping and raking leaves on the train. Both were real works of art. These and a picture about ten yards long with beautiful miniature pictures of a play at court; about a hundred figures at least, were nearly mine, but we haggled till I got obstinate and I left them. I have been sorry for it ever since. I find these things in towns where Daimios used to have castles. They have been abolished, and their braws bave been sold for nothing. I was offered a couple of rock ow,

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crystal balls, as big as oranges, but 10l. and 12l. was too much for my travelling purse, and I don't know the British value of rock crystal. Of this I am sure, the Regalia ball is not finer than these were, and I believe that I ought to have haggled for them, which I'did not. The mountain country is really beautiful. The hills are steep and furrowed In these grow pines, bamboo, cryptomeria, with ravines. camellias in flower and budding amongst the snow, and shrubs without end, of which I recognize a few. The high tops were covered with yellow bamboo grass. There deer and mountain goats abound. In the lew grounds pheasants are numerous. A very good Frenchman Paul Carrey who crossed the Pacific with me was my comrade part of the way. He carried a gun. One day we stopped to let him shoot, he brought home five pheasants and saw about 100. But the men who went with him, as soon as they saw him kill flying, did all they knew to frighten the birds, and drive them off their preserves. At last they led Carrey to the high road and brought him home. He has gone to Yokohama again by a round-about mountain road. If he turns up in London, be kind to him, he speaks good English, and is related to the great Laplace. As for the people they seem to be the most polite, civil, good-humoured, well-washed, clean critturs I ever fell in with. I have not seen one hurt a creature. I have not heard a cross word spoken since I came to Japan. I hardly hear a child cry. They are laughing and giggling all about this house now, and they have been laughing ever since I came among them. They are continually twangling guitars and singing execrably. They work like horses. Men haul enormous loads on carts where the roads are fit for wheels; men women and children carry loads that would astonish a porter. When the roads are fit for carriages, I get into a go-cart and put on a leader because I am heavy. My luggage goes in a second jinrikisha, and my boy in a third, and off we go at eight miles an hour for twenty miles with an occasional halt to drink tea. Then men and "horses" get round a fire made in a square hole in the ground, sit on mats, smoke, drink tea, and jabber. Then we go off again laughing, shouting, and running as if hauling me were play. The pay is about a penny a man a mile. My day's expenses are about eight shillings. Yesterday I came 36 miles over this lake in a steamer, in mist and rain, and was bored. To day I stopped to rest and amuse myself and very well amused I have been. And now it is time to put on my Archangel night gown and roll in my plaid, and sleep as well as I can, for the noise of priests and cats, and bells and drums, and the giggling of my landlady, who is next door serving supper to some travellers. She has blackened teeth and shaven eyebrows like all respectable married women in this curious land, and she is perfectly hideous like most of them. I have bought some photographs of noted beauties. I think them generally like Lapps and Samoyedes with curious long turned up eyes and broad noses. My landlord who has been watching my pen and wrapping up my feet all night has just lighted a new candle. I have burned a whole one to this letter. So good night—Saianara.

J. F. C.

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Monday, 11th.—41° inside, 39° outside. My rooms are very dark, but very grand, prepared for Daimios and their retainers.

Two sword-rests have places for seventeen swords, and grand lacquer and gold crests. That seems to mean a retinue of thirty-four swells. Went out shopping, and walked over an abominable, muddy, crowded road, seven and a half miles to Kioto. My landlord hauled my goods in a jinrikisha. On the road met two Aryans, and realized the difference of races. I had not seen an Aryan face since I parted from the Frenchman, and I was struck with the white skin and yellow beard of one of the people of Indra. I got the news. A lot of Aryan officers are employed hereabouts. I took quarters in a very nice tea-house near a bridge on the Tokaido road; made up my accounts, ate some tiffin, and wandered in the streets till dark, eleven miles and a half in all. This town is built at right angles, and very well built. Everybody is well-dressed. Lots of men wear swords. A fair is going on. All the people stop to stare at me when I stop to look at a shop, or at a temple, or at a show. I am a rare creature in Kioto, the first foreigner that ever lodged in this house. Wrote letters. Not long ago there was an exhibition on the British model at Kioto, and then a lot of foreigners appeared. As soon as the show ended, the place was closed to foreigners without permits. One thought has bred muny exhibitions.

Tuesday, Jan. 12, 1875.—44° inside. Sunny and fine. Went out shopping. Walked up the hill to the east, 700 feet. The view over Kioto from Shogun'sya, where the Shoguns were buried long ago, is very curious. The town is on a wide river flat. All the houses are of one height; all their roofs of one dark brown colour. The brown landscape is dotted with numberless white gables diminishing with the distance, all gleaming with the evening sun. On three sides

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the plain is bounded by mountains from one to 2,000 feet high. On the third, south-west, side the river Kamagawa shines in the hazy air. Only a few large buildings on the outskirts of the town show above the level; the only visible smoke is from a china factory. Theatre drums, bells and gongs from temples on the hill-side, the cawing of crows, the screaming of kites, and a babble of Japanese voices came up from below, and the wind sighed and rustled amongst the bamboo grass and the pines on the hill-side. I thought of Florence and of Moscow as I saw them in 1873, and could think of nothing quite like this strange view of Kioto. most like Florence devoid of architecture. The temple which I passed on the way up is very fine. I doffed my shoes and went in. A gleam of sun lit up a kneeling congregation of men, women, and children, and the shaven heads of three or four priests who knelt in the first row. Behind a readingdesk an old priest in robes, with a gilt fan in his hand, was preaching a sermon in the curious falsetto which actors use on the stage. Presently he finished, and retired to an altar with gilded pillars, and lacquer and gear which shone in the dark back-ground. The priests began to beat a drum—tum; tum; tum; tum; and all the congregation chanted No; no; no; no; for five minutes, while the preacher knelt and bowed towards the altar exactly like a Catholic priest. His bows were lower, that was the chief difference in the ceremony. Then he came back to his desk, unfolded a silken cover, opened a book, and began a second sermon. I could not understand, so I went up the hill to the biggest bell in Japan. It is nine feet four inches in diameter, eleven inches thick at the rim, and I reckon ten feet high. The outside is

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ornamented with strange devices, the inside rough from the mould. It was cast in the fifteenth year of Kengi. The roar of it was magnificent at night. On coming down went through a tea-field to another temple, with a grand wooden pagoda of carved beams, and then at sunset came back to my beautifully clean hotel. A merchant of Osaka has sent for a singing girl, and there she is next door twangling a koto. My old merchant woman came with knives; I bought a lot.

Wednesday, 13th.—My old woman with pictures came, and charged me three sius for painting and mending. Gave her the odd siu, threepence, which she could not at first comprehend. Such generosity was unheard of.

The Picture.—This is a stamped picture, therefore by a good artist, manifestly very old. Figure on horseback, dressed in gold-mounted chain-armour, with a white horsehair plume to his helmet, two swords, one of the long curved pattern, which is shown at the temples, on his left side. In his right hand is a baton of command, used in war, with sixty strips of gilt paper. "When battle begins, hold up; when go back, hold back; when go to right, hold to the right; show soldiers, called Saihai." Bear-skin shoes, stirrups of iron inlaid, of the pattern commonly sold in the curio shops. Gilded leather saddle, silk housings, tiger skin hangings, all the horse gear is of the pattern still to be seen occasionally; silken robes. "Anybody knows that is a picture of Takida Shingen, same as Tycoon, governor of the middle district of Japan. He lived at Kofix, about 400 years ago, say 1450. Bought at Hosochte, on the Nakasendo, and mounted at Kioto." I saw few pictures of the class, so I note the costume.

ROLL PICTURE.—Bought at Kano, chiefly to roll up the old

one in; represents kitchen work, a man with rice; stamped; signed Shosai.

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The knife handles have a story, and they are curious works of Japanese art. The knives are worn in the sheaths of swords and are meant for cutting paper, as I am told. were sharp enough to cut throats. A black one is a concert. A mill is the Yodo Castle water supply from Ugikawa, near Kioto. The moon and a kiri tree. A devil, "Niwo," is a Buddhist giant who guards temple doors. A lot of flies means Summer and Autumn. Hoka Roku Gin is a long-headed man who remembered Buddha's sermons. Gold cap, Kuno Kami, one of the 7, between Shinto and Buddha, means fortune. A dragon, gold, "Amario." A lion and a toko, a thing held in the hand when praying to Buddha. Nine stars and karaktha grass. A cock on a drum. Horse tied to a cherry-tree. A lobster and sundries mean the January house decorations. A river fish and a waterfall mean high rank, aspirations, ambition. A centipede, water, and a post. Where the river runs out at Biwako, are two bridges, the post means the rail. Between them a small hill. "That worm be there, seven times as long Jawarra Toda ni de Sato. Shot him with as round the hill. a bow and arrow, but the arrow did not go in. He put spit on the point of the arrow, and then shoot him and kill him. He stood on the bridge."

A long-tailed tortoise and a tree, used at weddings. A priest and poet looking at Fuji San. "Saingo Nosh. He travelled Japan, and made verses, and looked at views everywhere." "Hoto tonge," a bird that sings in the sky, but cannot see it, says cuckoo. I had twenty-eight different designs and four duplicates—thirty-two sword knives, and

rejoiced in my collection. A bronze temple vessel stamped Steming, by a very old maker, who lived about 1600. After packing went out walking, and walked five miles to the eastle, which is a curious walled inclosure, with a white pagoda, and green trees looking over the white wall. Nine years ago the upper wall was riddled with shot, during a fight between the troops of the Mikado and Shogun. Now the mud wall which rises above a wall of stone, built Cyclopean fashion as usual, is whitewashed, and mended. The revolution is ancient history already. Went next to the Mikado's palace, of which part is a court-house. There saw a prisoner tied with ropes, being led off to jail or punishment. There is nothing striking about this building except the usual Japanese gates. There was no striking of the prisoner, but somehow he reminded me of an old cock that was brought to me bound in like fashion for execution. I thought of the carpenter play, and the talk about torture, and thought the guards grim. My old woman came at night with more bronzes, which tempted me to buy. Much music and singing, and laughing till a late hour.

Thursday, 14th.—44° inside, cold, sharp, wind outside, fresh snow on the hill tops. Walked nine miles about the town, shopping, and looking at temples. These were so dark inside, that I could not see their agnificence. The likeness to Catholic altars struck me once more. In one a grand ceremony, the shaving of a priest's head, was going on. The place was crowded. The women sat on the floor furthest in, each with a long feather of white paper stuck in her black hair. The men, with some few women amongst them, crouched together outside, and looked over each other from behind pillars. I looked over them all, and admired the

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traerybut deand strange scene which faded into darkness, and glimmering lights, and flashing gold, and lacquer tables, and altars, and silk vestments. Walked next to the opposite northwest corner of the town, where is a temple dedicated to a Shinto Kami who is fond of buds and flowers, and boys and girls. It is a very pretty place, and the wood-carvings are as usual beautiful. A lot of boys were running a hundred times round; they carried a bundle of sticks in their hands, and dropped one at each turn. On a building by the temple were pictures and samples of good writing by scholars of the school. A lot of men were busy transplanting a tree. The roots with a large ball of earth, were carefully roped up, and the whole operation was well done. In fact the Japanese are skilled gardeners. In a neighbouring street found a building marked in English, "Office for the Promotion of the Labour of Women." Two girls stood near in grand attire, well painted. They were scholars, and this is one of many schools for girls.

Lunched on duck stew and eel soup at a tea-house near the castle; bill for two, including sake, a boo and a half, 1s. 6d. Bought no end of curios in out-of-the-way shops, where the prices were very low. When I got home, packed all my gear in a big packing-case, intended for England. A quiet evening, for my noisy neighbour is gone. He was a sick officer who drank sake and amused himself with music.

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Friday 15th.—44°. Walked five miles to Shimi, and took carriage at last to catch the steamer at noon. Visited daiboots, a gigantic bronze head of Buddha, admired monkeys, who had red faces and whiskers, and played wonderful feats.

They seemed merry and wise, like Japanese. Looked at people making figures in clay all along the road. Hired a boat as the steamer had gone at 11, and got to Osăka about 10 P.M. Lots of curious scenes by moonlight. Bridges, lights, boats, bells. Got to the French hotel.

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Saturday 16th.—45°. The mail in on Friday night, so made up my mind to another week, and went shopping and wandering. Got to the mint at last, and called on Major Kinder. The town is on the delta of a large river, with branches in all directions. Walked nine miles.

Sunday, 17th.-44°. Rain, 31.000. Wandered the streets all day, looking for curios. Got to a Shinto temple at last, a very curious place, with lots of people saying prayers. First they rang the bell, then they clapped their hands twice, then they rubbed their palms together and muttered, then they threw cash into a box, and went to the next shrine. One was dedicated to Inari Sama, with foxes in wood and stone, and arcades of red Torri. I don't know whether these arcades were meant to suggest a fox's earth, but they did suggest that idea. The priests in a neighbouring temple were chanting vespers, and singing rather well for Japan. Bells and drums and hand-clapping were going on in all directions. The view over the city was strange and foreign. Dined at the French hotel with some sea-captains, who spoke English, low German, and Norse. The French landlord praised a missionary who never spoke "Bêtise—la Religion" to him. A Pacific mail steamer was burned near Hong Kong; 200 Chinese passengers lost. That is the chief news. Sent my desk to be lacquered and my plaid to be embroidered in memory of Japan. A queer day.

Monday, 18th.—49°, bright, cold. Went to Kobe by rail, and returned. Took ticket for Sunday morning. Forty cubic feet equal to one ton. Freight to London 98s. The steamer Japan, burnt 17th December, lost mails, 400,000 dollars treasure, and 200 Chinamen. I am not sure, but I think this was the steamer on which I had nearly embarked at Yokohama. If not, it was the preceding steamer in which I thought of starting. The country is a shelving plain, ending suddenly at water-worn hills. In cuttings, the ground seems to be made of stratified sands and large rolled stones. Some terraces on the hill-sides have tombs on them, and seem to indicate recent elevation. Several earthquakes have been recorded. I felt one at Kioto. The house shook, and the shutters rattled for a considerable time, as if a heavy waggon was passing over payement. I felt none of the recorded sensations, and no one seemed to be disturbed. I felt another shock of the same kind at Tokio. These prove that Japan, for a distance of more than 300 miles, is now moving. The sea rose and flooded Kobe not long ago.

Tuesday, 19th.—Walked to the Mint, looked at it, and went Curio hunting, after tiffin with the major. Bought sword-hilts in the street, near the castle. That is a structure like the Yedo castle—a moat, a cyclopean wall, gates, pagodas at the corners, great stones near the gates. A camp fire with a covering becomes a tent; that grows to be a house. A house with a ditch grows to be a castle; that becomes a walled town. Paris was a walled town, and the Reds tried to get back to the original walled fire without a roof. The same bright idea prevails at Chicago, and possibly at Virginia City. Got my plaid embroidered as my covering in many a

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camp, and got home at dark. It has struck me many a time that man-power carriages are a mistake. The manager of the Mint wanted engines to weigh his coins, and got one from England. He wanted more made, and he found artists able to make them, who were acting the part of cab-horses in Osăka till he found them out. Now these coin-weighing engines rank high in England as skilled work and ingenious devices. It seems like cutting sticks with a razor to turn watchmakers into ponies. But men, like ponies, must eat to live, and the revolution turned everything heels over head, as usual.

Wednesday, 20th.—Packed and went to Kobe by rail. Took quarters at Mrs. Green's Hotel. What a pretty creature is a pretty Aryan woman amidst Turanians!

Thursday, 21st.—Passed goods at Custom-house. Called on the Consul. Walked about curio hunting.

Friday, 22nd.—Walked about curio hunting. Dined with the Consul. Sang and danced.

Saturday, 23rd.—Walked about. Looked at a Shinto temple, and fed the sacred Albino pony with peas. Shipped goods and self at dark on board Costa Rica.

Sunday 24th.—Sailed at three. All day in the Inland Sea, among islands and junks. Very fine and cold. The hills all water worn, and of one form. Very pretty. No raised sea margin to be seen anywhere, so the land has not risen of late. Passed a large walled town and many temples. Very few people on board.

Monday, 25th.—Passed out of the Inland Sea about 4 A.M. Ran through islands, and into Nagasaki at dark. Strong breeze northerly. Snow and hail, cold and chilly. It's all

very well steaming about the world, but walking is better fun.

Tucsday, 26th.—Landed and hunted curios. Sailed at 5.10 P.M. Cold, chilly, misty; fresh snow on all the hills. The sights of the place are the old Dutch settlement; the island where the missionaries were run off the cliff; and the scenery, which is beautiful. I had just got so far when a French traveller announces that we are returning to Nagasaki. Fog.

Wednesday, 27th.—Got under way about 4, and ran out again. Cold, damp, disagreeable weather, with snow showers. Passing to the south of islands with tall hills: part of Japan. About noon; passed to the northward of small islands with stacks, called the Asses' Ears.

Thursday, 28th.—Fine smooth sea. The water of the Yellow Sea is dirty with the mud of the Yangtse Kiang; a hundred miles off shore. Made up temperatures and posted them for a friend at Tokio.

Friday, 29th.—Heavy storm in the night off shore. Got to the lights at dawn. At noon got to the lightship and w. for the tide on the bar. The water of this countriver is 40° and as dirty as the Mississippi; a year orown. The air is 31° at 8, and the writer freezing on leck. This in Lat. 31° 12′ N. Took on board Chinese pilot and aptain of the lightship. Coast not to be seen on either hand. On this voyage the range of water temperatures is from 63° to  $40^{\circ} = 23$  degrees colder here than off Japan in the hot stream of the Pacific. The Chinese coast climate is said to be excessive. Hot in summer, over 90°. Cold in winter, under 30°—about the latitude of Suez.

W.

Books.—Before leaving Japan something may be said about the books, which amuse the people, and amused me. It would take a small volume, many interpreters, and much study to do justice to the literature of a whole country which is proud of ancient learning. A traveller cannot do that. I can but notice that which struck me during my wanderings and won-There is no fun in buying a salmon in a shop, but it is grand fun to catch a salmon in a Norwegian river. So it is with curious knowledge; the best part of it is hunting it down under difficulties. The Japanese Asiatic Society have printed a lot of stories since I came away, but nobody has touched popular tales in earnest. That I know from talks with my squire whom I set to collect tales.

THE SHAPE OF A BOOK.—In a drawing, a man's head or a hill-top is placed next to that edge of the paper which is furthest from the artist, and is at the top of the picture when it is hung on a wall. N.

When I think geographically I have learned to fancy myself looking at a country with my face towards the north The geography book used to say, "The top of the map is towards the north, the bottom towards the south; the right-hand side towards the east; the left-hand side towards Japanese geographers put their country on paper, E. as it happens best to fit the sheet, and indicate bearings by a compass. They probably learned the use of that instrument from the Chinese. Kita is north; Higashi, east; Mianami, south; Nishi, west. These points may be in any corners of the paper, and names may read any way, but, for choice, the top of the map still is towards the north, and the names read downwards. They are usually written within a cartouche.

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For map read "book," and these geographical definitions may serve to explain the order of written characters in Japan. The top of each letter is where the head of a man or the top of a hill would be in a drawing; north in a map.

West

The Japanese book is a long roll written on one side, rolled or folded. It is like the long roll of paper on which marriage contracts were written in Scotland about a couple of hundred years ago. It is something like a ribbon or a web of cloth, with two ends; which may be rolled from the right hand towards the left, or from the left towards the right, or, with both hands, away from the body, or towards it. The beginning of a Japanese roll of writing is at the right-hand end, and a reader holds the roll in both hands, and rolls it up from east to west, from right to left, as he reads. The beginning of a Scotch roll is at the top, and the reader reads from north southwards, if the bottom of this "map" be towards the south. Give a Japanese roll a quarter turn east to north, begin at the top, and all letters and lines follow each other in the same order as letters and lines do on a Scotch roll of writing. The Chinese characters used in Japan express a syllable, or a name, or a thing. The position of a character is no greater difficulty to a Japanese reader than it is to a compositor. They write and draw upside down or sideways with equal dexterity. The roll held vertically instead of horizontally reads in this fashion, with letters on their sides-

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62	nik ko and To kio kio kio to to are	dru od → 2
60		— <u>→</u> 3

There was grand talk about changing the Japanese method of writing, in order to suit the rest of the world.

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ese ld. It can be done by turning the letters one-quarter of a circle to the right, thus—Nik ko and To kio and Kio to are in Nip pon. The roll held by the edges instead of by the ends will then read like an old Scotch marriage settlement.

A Japanese bound book is the long roll folded so as to keep blank sides together, and stitched at the side through the folds. An English legal document written upon many skins is stitched at the lower edge, and begins at the furthest edge of the lowest skin in the package. A reader holds the edges of the roll. If the letters were turned one-quarter to the left, or the roll one-quarter to the right, the Western conveyance would be arranged like the Eastern Japanese roll

of writing—		5	4	3	2	1	
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	<b>2</b>	made		e	d	$\mathbf{n}$	i
	3	between	1	$\mathbf{e}$	e	t	8
	4	&c.		$\mathbf{n}$		u	
	5	&c.		&c.	b	r	i
			1	&c.	е	e	$\mathbf{n}$

For some reason it pleased Easterns to begin at the right or east end of their maps, and Westerns to begin at the western or left hand of their books. The inventors of writing probably began to carve pictures and symbols on rocks, and trees, and stones; at the top, opposite to their eyes, and wrote downwards as the Japanese and Chinese do, and as all men do naturally when they inscribe their ideas and scribble or walls. I suppose that nobody ever saw a mural inscription which began at the bottom of a wall and read upwards. Ogham is an exception.

It is for the learned to discover how men wrote in Central Asia. All the savages and schoolboys that ever I knew began their writings as high as ever they could reach, and came down gradually towards the earth.

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Toy-Books.—I bought a lot of toy-books and studied them with my squire. They faithfully depict Japanese life. For example, I find all the steps in the invention of a mill which I noticed in Japan, and one which I did not see. A pair of wheels, made like the usual cart wheels, are joined by boards, so as to make buckets. The lower part of this primitive water-wheel is in water, and a man resting his crossed arms on a cross-bar between two uprights; or, holding by a pole to steady himself, walks up the wheel so as to raise water in the buckets to a higher level for irrigation or for domestic use. Having got so far, the next step was to get falling water to turn the wheel the other way, and save human labour on this tread-mill. This is characteristic of that Japanese art which seems to turn everything the opposite way at first, and to come right at last. A carpenter pulls his plane towards him, and pulls the teeth of a saw towards him through the wood; but he is anxious to learn how other carpenters work, and to change his ways for the better if he sees his way to improvement in novelty. So it is in all Japanese arts and engines. They try, and succeed.

In all the big towns of Japan book shops and print shops abound. New prints are continually coming out, and they spread through the country, and convey the spirit of the times. I bought one set of prints in the modern Eurasian style, which was popular in tea-houses along my road. It is very Japanese, and partakes of European and native coarse-

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ness. It is about the equivalent of Gilray's caricatures. theatre curtain is drawn back by a man whose legs appear on the stage, and the audience are suffering many absurd calamities. The equivalent of "apples, oranges, ginger beer, porter, ale, cider,"—the man who brings tea, has tumbled. One box full of people are scalded by the kettle; another lot are battered by a shower of scattered luncheon boxes; another lot laugh. There is more expression in that scene than in all the Chinese art that ever I saw. It is vulgar, but very clever. A boat is passing under a bridge; a vendor of umbrellas leans his burden on the rail, and the swells in the boat are speared by falling umbrellas. Gilray did nothing better in the way of broad farce. A party of the youth of the period, in uniform, seated on chairs by a table, have come to grief with a sodawater bottle. A tea girl is dismayed and amazed. It is the old world and the new B. and S. in Japan. A coolie has dropped a pail of something, which has upset a jinrikisha man, on whom his fare is falling. It is a pantomime trick with the butter slide in it, but Japanese of the present day in every line. A red-faced monkey has got loose, and has climbed a telegraph pole, and the picture is full of astonished and dismayed caricatures. Two eats, fighting on a veranda, have upset a dwarf tree, which has fallen on the eyes of a coolie; nurse and babies form a tableau. The picture tells its own story admirably. There is a street fight near a railway station and a confusion of coolies that is wonderful for action and expression. It is grotesque. So the book goes on showing life in the capital, as it now is, with all possible mishaps and misadventures; all are caricatured with extraordinary grotesque power. The strange thing is to find photographic

cameras, carriages, horses, and European clothes jumbled up with the manners and customs and costumes of old Japan. It is all true to nature. Polo is on one page; a native naked bath on another. That is the modern taste. The spirit of Gilray is in Japan, modified by German and French caricature.

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Take again a modern Buddhist book of another kind as explained by my squire at Kicto in January 1875. It is "The life of a man." "If anybody do this way he do well." The title page is at the Eastern end of the book, and the first line, to the right of the page, reads from the top downwards. Like everything else in Japan, reading is the reverse of Western reading, and binding is quite as antipodean and original.

Page 1.—A famous wood engraving on paper, which is superexcellent for printing upon, and durable and light. My interpreter read the page of letters and says, "Man reading to the servants," Japanese family prayers or lectures.

No. 2.—" A dutiful son working for parents."

No. 3.—"If high, mountain not useful. If got trees, then useful; so great man without wisdom," &c. A small astonished boy with outspread hands is taking in the wisdom of a grave personage in pattens who is pointing at a landscape.

No. 4.—"Wisdom is better than strength." A corpulent coolie and a genteel wise student, who is surveying strength with an air of contemptuous self-complacency that is inimitable; muscle is at a discount, brains at a premium. But there is the text on which half the popular tales of the world are founded, "Wisdom is better than brute force." The dwarf beats the giant.

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No. 5.—"A jewel if clean shines; if unclean dull: so man must have science and virtue." Something like a crystal ball upon a tripod is shining, with straight lines; a shock-headed personage amazed is upon one knee; a solemn upright sagacious sage is pointing the moral in a fitting costume. He is pointing at the jewels of wisdom and virtue, the pearls of great price.

No. 6.—"When young must learn, or old nothing know." A Japanese boy, holding a Japanese brush, is writing on a book, laid on a Japanese table, seated on the floor of a Japanese room, in front of a solemn shaven Japanese tutor, with a face all over priggish philosophy. It is Japanese all over, and for art it is good as the best block books of early Europe.

No. 7.—"Help parents, if not same as crows." A crow, admirably drawn, is croaking at an astonished dismayed boy, to whom the sage is showing a great pile of logs and stones. The industrious crow, exceedingly well designed, is flying towards the idle crow, with a twig. It is Hogarth's apprentices. It needs small wisdom to twig the meaning of the page. It means that men must work to live and ought to help those who are past work, and that is a good lesson.

No. 8.—"Young men reverence age as father." A lot of figures are doing it with admirable expression and action. They are reverencing age Japanically.

No. 9.—"If see do good, go with; if see do bad, go away." A lantern in a temple, a lecturer pointing over the temple wall; a lad with a small paper lantern looking out sharp; and a lesser lad listening and looking out into the wide wicked world.

No. 10.—"Don't learn to gamble and play." Bad example is playing the koto; good boy is writing, but pausing and looking over his shoulder. Hercules had a lesson of the kind if I remember my old lessons. A Scotch minister, to promote gravity, lately smashed the only fiddle in the parish.

No. 11.—"Before rank be modest." The pupil is being modest with all his might, before a magnificent mighty kunji, with the cap of his magnificent order of nobility, which has been abolished. Here we learn courtly manners, and truly they are quaint. But quaint as they are in Japanese dress, they are quainter still in the new republican court dress of the period; to wit, stick-ups, topper, and tails.

No. 12.—"Pray to the gods." The pupil is doing it. As Mr. Squeers said, "First they learns it out of the book, and then they goes and does it." These two sections of this whole duty of man may be read, "Fear God, honour the king;" and that is a good lesson for any land.

No. 13.—"If idle lose goods; get hungry as monkey hungry;" or in English, "Work, boys, work; and be contented." Don't be like "lazy Lawrence." There sits our idle Darwinian relative, who could speak, and would, if he were not afraid of being set to work. He is up a tree near a waterfall, eating with the appetite of a hungry savage. I know him well, and I know that his face is red in Japan, so red that I thought he was a painted ape, till I know better. He is an absurdly human personage, and seems to have suggested Japanese fiends.

No. 14.—"Avoid slander, fear listener." There they are, eavesdropper behind a screen; spite, and eager listener, with

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idiotic enjoyment and horror expressed in a few artistic lines of face. It is excellent, and very like an old caricature called "Symptoms."

No. 15.—"As wheel turn an axle, so tongue talk good or bad." One of the sort of coolies that I met near Maiboro is hauling a long cart heavily laden, with the usual jointed, ill-made old Japanese wheels of the olden time, turning on the hub of the engine. Boston "hub of the world" could hardly find a better illustration of the value of talk. The world goes round upon wheels in spite of tall talk.

No. 16.—"If charitable, happy, fortunate." The charitable person has been having a quiet smoke, and he is handing a gift to an eager seedy suitor in the attitude of respect for rank, holding out both palms, under his long chin. His fan is beside him, so he ought to be a poor relation or a priest. It seems that rank and riches are respected in Japan, and Mammon is worshipped like the almighty dollar.

No. 17.—"If man dead called good; beast called bad" (Reputation). The beast is a roll picture of a tiger hung in the holy corner. Lecturer and scholar form a tableau, seated on the floor. I presume that the warlike tiger is the defeated soldier class, "no sabe."

No. 18.—"If rich, don't think too much of riches." Thoughtful Dives, all alone, is thinking and smoking, and working at his ledger, with the counting gridiron beside him, and a rich room behind. Thought and self are in every line, and the rich man is all alone with his pipe. That is another short sermon, and not a bad one.

No. 19.—"If poor, don't covet too much." A woman is cooking. A man has got a small cup in his hand, and is

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are, ith coveting as hard as he can the excellent dinner that is being cooked, and the *sake* in the bottle, and the dinner on the tray. That is not a bad sermon for priests who live on alms; don't be greedy.

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No. 20.—"One day, one little lesson; 365 in a year." A little lad is drawing characters, which look very like footprints. The tutor looks over his pupil's shoulder, and looks wise. "Footprints on the sands of time."

No. 21.—"If teacher walk, step not on shadow; as father treat: walk seven feet away." The teacher, with his sword on his left side, is taking a walk towards a temple, followed by his shadow. Two respectful Jap imps, with heads shaven into the usual patterns, keep out of the shadow, and out of the reach of the sword. That is not a bad lesson for schoolboys to learn from masters in these later days.

No. 22.—"If drunken, like crazy that will not learn." Crazy, half naked, is waking terrified at something unknown to this learner, but supposed to be a bogle evolved by crazy from his own inner consciousness.

No. 23.—"Shien loved learning; had no oil; put glowworms in basket, and got rich and learned." There he is, in a dilapidated dwelling, reading below a bag of glow-worms. But, this being a story unknown to me, the picture needs the interpretation.

No. 24.—"Kekan was third; always read." The third in his examination is an old fellow with a long beard, leaning on a hoe, near a stack of rice, in a rice-field. I never heard more about him, but manifestly he was a famous scholar, for he is reading instead of minding his business, which was to till the earth. It is to be hoped that he made

rent out of his brains, and earned many kokos of rice by writing notes.

No. 25.—"Hakuà, when five years old, made a poem; nine years old teacher." Such is the march of Japanese intellect and its reward. There sits the intelligent young poet on a Chinese stool, with a lamp and shade sliding on a pole, reading. Inkstone and brushes are on a table with crooked legs; and a distant view of a stormy sea is behind him. I know nothing about this prizeman; but my boy knew him, and everybody knows him out in Japan. All these mean that learning is honoured and is rewarded. Hence competitive examinations, mandarin's squeeze, and failure.

No. 26.—" Shimisen was first mountain." Here my squire would not go on, and said, "Now, no good; don't believe." That was exactly what I wanted to know, and as usual could not find out. It is a legend. A lot of houses and trees are on the flat surface of a mountain, shaped like a sun-dial, with stalk and steps. The sun and the moon are behind it, and the sea below it. I suppose that it means some history of creation, and that it may be derived from some real mountain, which was, or is, a sacred high place, whose geography is unknown to me. I found a sacred inaccessible rock in Ceylon afterwards, with a dagoba on the top of an overhanging cliff. I have often seen this book mountain carved and depicted. I had learned the name of it. Shimisen was the sound of it, and it seems to be east of the sun and west of the moon by the picture, somewhere unknown. My next journey ought to be much in search of it, and I should seek it in Central Asia. Did this first mountain grow in the sea like Stromboli?

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in ing ever ous ess, ade No. 27.—" Parents nourish children; grain and grass grow in the sun." Mamma and baby, and proud parent; a few clever touches to indicate house, screen, and a landscape, make this picture.

No. 28.—"Osho was kind to parents; go out to sea; fish come up; give parents; glad." Osho, like Tobit, has gripped a very fine tai-fish with his hands, and he is glad all over. So have I rejoiced over a forty-four pound salmon in Norway.

No. 29.—Yang-u made grave for parents; birds take away earth; so carry more." Two crows are flying away, and old Yang-u, like the sign Libra, is carrying two baskets full of earth, balanced on a bending pole. He is striding along the snowy road after two crows. A third is flying after him.

No. 30.—"Life-like leaf; if strong, wind tear; so man sick soon die." The leaves are banana leaves, and the moral of tale is manifest; they tear in the wind, and wither and fall yearly. "He that drinks and goes to bed sober, falls as the leaves do; falls as the leaves do; and dies in October." So goes the song.

No. 31.—"Jiu (a jewel) come out of sea. If from mountain, jiokino (a crystal I suppose); so with body when man dead." I presume that the living principle which is to go on in other bodies, according to Buddhists, is the meaning of this symbol, Three balls upon a tall four-legged table, and two sharp-topped pear-shaped jewels on a three-legged low stool, with a white cover on it, shine "like a good deed in this naughty world." So good deeds elevate in the next life of a Buddhist man.

No. 32—" Gashi transformed himself to everything in turn; but even he died." With a fan in his hand he is about to

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project himself into space from the rail of a mountain temple towards a full moon. He is very ugly, and I know no more of his story.

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No. 33.—"Priest get flowers give to Butsu" (Buddha). Shaven boy, books, clogs, and flowers, going into a temple; roll books on a table in the background. "Figlio prete," say the Italians; may you have a son a priest.

No. 34.—"This book was made for children; don't forget; read." A preceptor, with his fan in the left hand, sits with a stalked reading-desk before him, and portions of four pupils with shaven crowns and shock heads read and say their lessons in profile.

No. 35.—" Japanese alphabets" end the remarkable book which deserves to be better known. The price of it is absurdly small, and the knowledge of Japanese teaching which may be extracted from my squire's explanation and from the pictures was worth a great deal to me, who love learning, and read by glow-worm's light, when I have no oil like "Shien." A stone to his cairn.

Modern books of all classes are sold in dozens, and are stored in cartloads in shops. They are rich in illustration, and the art is generally good. Of course evil books can be got if sought; but evil intention is not a distinctive character in Japanese books. Rabelais reminds me of Japanese pictorial fun at the worst.

Turn back, and the art is better, and the meaning as pure. "The life of a lady" is an old printed book, full of woodcuts that remind one of early German block books. It is sought by collectors, but the price is small. For action and expression the figures are excellent. They are perfectly Japanese,

and show what life was like when the artist lived. There is not a sign of foreign influences about the pictures. There are the ancient styles of writing which ought to be learned-landscapes, houses, dinners, manners, daimios, dresses, archery, picnics, furniture. It is life as it used to be in Japan. Here, for instance, is the Japanese cabinet, which has gone out of fashion, or has been sold and exported. Here are the arms and armour which have gone into the old shops; here the dresses worn only in theatres. Here is the fight with the dragon, the triumph of the true knight, the flight of the cowardly squire. There is no coarseness, and very little caricature in this wonderful old book made for good girls to study. It is a work of art. From it I learned, by the help of my squire, that a lady's education included legends, and so I set my squire to explain a lot of toy books which hardly need explanation to one versed in popular lore; they are so well done. This is not the place for telling Japanese stories. It is enough for me to say here that I have found a great many incidents which are common to the popular tales of three corners which I had selected for hunting-the Scotch Isles; the Isles of Japan; and Ceylon. If tales have a common origin Central Asia is the probable point of dispersion for tales, people, rivers, arts and sciences, manners and customs, and inventions. But did European missionaries teach the Japanese to print and to make illustrated block books? or did the far East send these arts from China or Thibet to the far West and East? Who invented printing? I do not know, and I do not know where to find the knowledge, unless I go to Thibet and meet the Russians.

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I carefully sought for Chinese toy-books and popular prints;

I found none, and I was solemnly and repeatedly assured that none are published in China. The ancients of China illustrated printed books with printed woodcuts, as I am assured the modern babyhood of China certainly has much to learn from toy-books, that Japanese infants have at their fingers' ends. If China sent civilization, the pupil has beat the masters.

I might say a good deal about Japanese books, for they interested me as pictures of daily life, and as records that I could read as I ran; but this is all that I mean to say about Japan and toy-books, and nursery tales, and stupid travels without a single adventure in them. I have extended my Circular Notes so far that they may tear like plantains in a gale if they be stretched any longer. So here ends this log, at the beginning of China and the end of Japan.

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Steamer "Costa Rica," in the River Yangtse Kiang, near Shanghai, Friday, January 29th, 1875.

MY DEAR MOTHER,

My last letter was from Ot in Japan, and went East by America from Kobe. I sailed from Kobe on Saturday, and I have been to Nagasaki and over the Yellow Sea in a storm. I believe that a long letter of mine, posted at Yokohama, was burned in the steamer Japan near Hong Kong, on the 17th of December. I was within an ace of taking a passage in her, but pluck had it, and I braved the cold, and walked through Japan, as my last letter tells in detail. Four hundred Chinese, two or three Europeans, and a vast treasure went to the bottom in the Japan. Two boats are still

missing. They suppose that they landed on the Chinese coast, and that the natives put the men to death and robbed the boats. On the whole, "it is better to be lucky than rich," as a man said to me the other day. I expect a letter from you at Shanghai and the Times. Meantime, I write in a smoking-room, with the air outside freezing, and this great dirty yellow river under me, with banks out of sight on either side. Last night we denced to the howling of a cold storm, which dismasted junks, and did other damage, but did not hurt the Costa Rica. I have been greatly entertained. but I cannot be amusing, for I have had no adventures. After Ot, I walked to Kioto, the ancient capital of Japan, and there wandered and bought curiosities, and looked at temples. and was a lion myself. When I stopped a crowd gatheredbut a good-humoured, pleasant crowd—who amused me, as I amused them. Thence I went to Osaka, and there I did the same thing.

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My purchases go home with bills of lading. Unpack if it amuses you, or leave the lot till I come, just as you please. At Kobe I wandered, and bough and smoked. I offered my Japanese boy to engage him as servant and valet; he was willing, but his uncle telegraphe I, "Come back," so he went back, and I am alone again. I think that I owe the uncle a day in harvest; but the boy was a good boy, and useful; and it would have been curious to make him learn English well enough to tell me steries, and read the numerous books which I have bought. I am not quite sure whether I am sorry or glad to be rid of my attendant, but rid of him I am. What I shall do next I cannot tell. If it were not so confoundedly cold, I think I should go up to Hangkow,

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some 700 miles, in the steamer. As it is, I think that I shall take an early boat to Hong Kong and see Canton, and get warm. I have not been warm for a month, and my fingers are frost bitten, and here I am about the latitude of Suez-31° 12′, or thereabouts, shivering till I found this smokingroom, wherein to write and get heated. I really have nothing to say, unless I copy my log; so I shall wait till I land-about dark this evening, I believe. I weighed 258 pounds before I started, 208 pounds at the other side of Japan, 191 pounds at Kobe; and i feel as strong as a pony Such are some of the results of globe-trotting—17 pounds of I hardly know myself, I am so genteel in figure, and active on my pins. No bread, little sugar, few potatoes, and long walks, did the job for me, and I recommend the prescription to all who aim at "banting." The great interest in Japan is to see a vhole people changed within ten years. They have changed their habits and their clothes. They have railroads, gas, telegraphs, and steamers, an army and navy, and national debts, paper-money, and wide-awake hats. Ten years ago they cut down strangers, and put them in eages. Not long ago they saw a rabbit for the first time. Thereupon everybody wanted a tame rabbit. One of the officers of this ship sold a rabbit and two young ones for 75 dollars, say 300 shillings, £15 in Kobe, 1,700 dollars. £340 were paid for a fancy rabbit from America. At last the Government put a dollar tax on every rabbit, and the mania ended in general slaughter. Tell W---, who loves rabbits, how dear they are. A Rabbit, according to myths, lives in the moon Those who see him go to the sky. There were no earthly rabbits in Japan of old.

No. XXXIII.

ASTOR HOUSE, SHANGHAI, Saturday, January 30th, 1875.

P.S.—We got in before dark all right. This morning I have seen the Times of Nov. 2nd and Dec. 1st. I have got the letters, My letter dates, are and shall look for more at Colombo. 15th and 29th Oct., Nov. 4th, Times, Dec. 1st. So my plan of first column advertisements acts well. It is cheap and effectual. This is a bustling place, full of Europeans going to a paper chase in buggies. I went to the Chinese city instead attended by a Chinese of this house. In seed him, and presently found him in a crowd with a mark on his cheek, and rumpled cuffs. He had said to me, "Take care of your pockets, 'the wild guides took offence and cuffed him. He is greatly disturbed because I did not join in the fray, and protect him from the roughs of a great walled, wild Chinese town. I did not find out what was up till the row was over or nearly. Then I sauntered into the midst smoking, with my hands in my pockets, heard the complaint of an indignant little opium-smoker, who said that my boy was a long-tailed — . who abused the Chinese, and then we sauntered out again calmly, and I came here to write to vou. I am not much tempted by Clinese wares so far. The art is inferior, the prices superior, and the wares are like those which abound in tea-she in London Just you look at my box, and you will all admire J a curios. Whatever I am to do with myself till the 5th, I don't I might go up the river at that would cost ten days, and time is getting on.

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I must now go dine, so thanks for all your news, and good-bye.

J. F. C.

P.S.—For something to do, I have re-written a geological paper. Now it is done.

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Saturday, last of January, 1875.

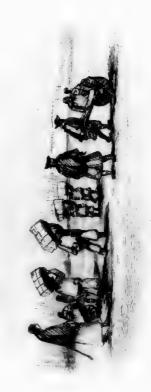
MOST EXCELLENT V.,

For your budget of news many thanks. Your date is before Gunpowder Plot day, and I owe you one. Japanese letters you must get from your mother; I cannot be bored to repeat them. I forget if I described one scene which amused me. It was bitter cold, with snow on the ground, and I was far up in the Japanese highlands. I stopped at a tea-house to get a fresh baggage-horse, and went in to drink sugarless tea. While drinking it, a voice came out of a corner, and my boy said, "that is the house-woman bathing." In front sat her son writing bills. I looked, and there at my shoulder was a great iron caldron on a fire, and in it an old woman in her birthday suit splashing. I poked the fire with my stick, and told my boy to say that she would make good soup. She larglied, and splashed, and rubbed her old shoulders with hot water, and never suspected that I was a little surprised. Such are some of the manners and customs in Japan. For the rest the people are good-humoured and pleasant, and have charming manners, and I like them. Here my chief impression is wheel-barrows. All over this town one meets wheel-barrows with one wheel and two seats, one on each side of a back like a jaunting car. A Chinese

holds two spokes, and when he has one passenger he leans to one side. The passenger sits with his arm on the back, one leg up, and the other dangling in a loop of rope. Fat old women; sober, grave, long-tailed blue men, and critturs of all Tartar kinds are to be seen in all manner of quaint dresses, wheeling each other about in these wheel-barrows, to my great entertainment. Anon comes a Sedan chair, poised on the shoulders of tall, well-dressed Tartarian Chinamen, who pace solemnly along, while some swell in spectacles, or lady in a bonnet, looks calmly out of the windows. Then whisk comes a buggy, and puff goes a steam-launch on the river, and Europe dashes past Asia to go to a paper chase, or to a banking-house, or to some Western institution in this far East. But everything Chinese seems to me slower than There men ran like athletes with jinrikishas, which Japan. are enlarged perambulators; here jinrikisha men shuffle and shamble in ragged clothes, and the wheel-barrows walk. In Japan everybody washes and bathes daily and frequently; here they never wash, and they are ragged. But the Chinamen are twice the size, if they have half the pluck; and these jolly old Conservatives of the East are very interesting after the Japanese Radicals. I quite fell in love with a blue Chinawoman out walking. Curves were her outlines. The Japanese aim at tight garments, trot and turn in their toes; my Chinese beauty waddled.

I wish I had news to return for your budget, but I have none. I came over with two East Lothian lads in the steamer; both officers on board—one was from Prestonpans, the other came from East Linton.

We had many talks about the family and matters of East



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Lothian. One was caught by the tide while robbing a hawk's nest with his brother near Tantallon, and had to sit the tide out on the cliff. The quantity of postage that I shall have to pay begins to frighten me. Thank G. and K. for their budgets, which were so interesting that I am going to read them all over again before I burn them. I have that habit, so write scandal as much as ever you please, and you will please me. That is the only thing which I cannot get out on the tramp.

February 3rd.—Last night I solemnly read, in order of date, all my home letters, and burned them all. Now I am going out to post this and get my ticket, and wander about the Chinese city. My impressions have grown to include thieves, rogues, and humbugs, dirt and stinks. I can find nothing that seems real in this great town; everything is a sham down to the language. "Get my breakfast quick" is "Boy, you go top side, catchee chow, chow—chop, chop." I shall not stay long in Chinese settlements. I cannot stop to draw or buy but I gather a crowd; I can't walk without being a gazing stock; I am run over by coolies and wheelbarrows, and I am getting to hate the Chinese.

Fare you all well,

J. F. C.

P.S.—This picture is a fashionable foot; I see lots out walking, staggering, and tottering.

No. XXXV.

On board the "Tigre," Mouth of the Yangtse Kiang River, China, 'Friday, February 5th, 1875.

MY DEAR ---

I am greatly amused by the Chinamen, but they are rogues and dirty dogs and disagreeable. Yesterday I got hold of a long-tailed, slipshod, ungartered, unwashed creature, who has been on a man-of-war, and speaks pigeon English. I picked him up in the street, and after him I crossed a bridge into a new world. Rows of coolies carrying water from the river rushed shouting, "Hi, ho! hi, ho!" along narrow, roughly-paved, dirty Chinese streets, swarming with people, who swarmed with live stock. Pigs, sheep, dogs, cocks and hens blocked the way. Now and then more shouting proclaimed the advent of a Mandarin. First came two pair of men in fancy dresses, with tall laced hats, yelling the Chinese for "Clear the way;" then came some five or six pair of long-robed Tartaric men with shaven polls and long tails and arms of sorts; then a chair carried on the shoulders of strapping bearers, in it the swell gravely gazing out of the front window; then a dozen more Chinese officials, and then the crowd closed in like a human sea, and jostled Then came a string of shouting coolies me as before. carrying goods to the river, and the fleet of junks, from under which the water-bearers took their pails. Then I fell in love with a Chinese bed, and asked the price-70 taels-about £22. Chin-chin, I said, and on we went. Then I fell in love with a China saucer on a street stand. The price? One dollar. I bought for ten cents (fivepence). Then on to an

open space, where jugglers were performing, and a Chinese doctor was putting a plaster on his own wounded arm. Then to the "number one mandarin place," there I paused. Behind wooden bars, in a regular cage for wild beasts, stood criminals, sliding out their paws for charity, like monkeys at the Zoological Gardens. Some had great heavy square collars on round their unhappy necks, so that they must suffer horribly when they try to sleep. They "makee steal," said my guide. Then we got to coarse instruments of torture, a square frame with four legs, into which a criminal is put. "He givee much little lice" (rice), said my man, and this one "makee dead two day," pointing to a tall one, in which the victim would have to stand on his toes or hang by the neck in the hole in the frame. "Mandarin keepee key," he explained further. Then we went on to a quiet place, where a lot of China boys were playing toss farthing with cash, and occasionally kicking a shuttlecock with the soles of their feet, struck inwards and upwards. "Chin-chin," said the boys, and clustered round me to stare. "Velly few Englishmen comee this joss-house," said my guide. We went in through dark passages, past long-robed priests followed by the boys, and following the doleful sound of a minute gong, and stumbled into light shining in at a wide open door, and saw how it struck upwards on the golden face of a gilded Buddah, thirty feet high, I reckon. A row of golden disciples were seated right and left of the prophet, grave and sedate as their master, and eight or ten feet high. The light lit up clouds of incense. Seated at ease, with back against the wall, in a kind of cage, sat an old fellow of grave countenance. In front of him, on two loops of cord, swung a bundle of straw,

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balancing like a pendulum. At long regular intervals he struck the gong, and then followed the roar and crash which had led me there. My guide explained, "One piecee woman makee baby makee dead, chin chin joss." "Chin-chin joss," said the boys in chorus, and grinned. The old man never moved his face, but sat still till it was time to bang the gong once more, and then he did it. Outside, in a courtyard stood a mighty bronze vase about eight feet high, of the old pattern, which I had got to know in Japan. Near it stood carved monsters, which you may see in any tea-shop, but bigger, older, quainter, and uglier than any that I had seen before. Turning back from the light there was the great golden Buddha, with his silver glory, and the light streaming upon his placid, meaningless face, contemplating the soles of his feet, and reduced to a state of mental inanity, which is beatitude, according to Buddhist priests. If I had not left my colours at home, I should have tried to sketch that joss, and his house and his votaries, and the swinging bundle, which may have been the baby or its semblance, for anything that I know. Out I went, and wandered on past a sunny wall. There sat a man plucking a fowl. Such a fine fat cochin china as would have gladdened your henwife's heart. Beside him sat a half-stripped old Spagnoletto beggar arranging his garments. He picked and he ate, and I thought of apes and Darwin. Instinctively I made my walking-stick into a tail, and I walked on solemnly trailing it after me, saddened by my ascent from the human ancestor of the Chinese. A horrible baby is now howling close to me, and I was a baby too, once, long ago. I may be an ape or an angel or a baby again soon, according to Buddha. I wandered

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about that Shangai city after the wagging pigtail of my dirty guide till my feet were sore, and then I crossed a bridge and was in the region of gas and pavements, and steamboats and magnificent European houses, and buggies and grandly-dressed Caucasians once more. They glared contemptuously at my rusty coat. I got a bad berth on board this ship as a ragged loafer, I suppose, and therefore it has occurred to me to write you this letter and ask for new cloth.

Send some photographs to my Japanese friends; that is, if I have not already asked some one to do this. I have thought of doing it so often that I am not sure whether I have ever put my thoughts on paper or not.

Here we are sailing on the Yellow Sea, which is yellow with mud. The sky is yellow with haze, and I am going to try to sketch. I have begun to feel warm enough to enjoy life. I expect to be too warm very soon. Meantime, the sunshine after the snow and cold of Japan is pleasanter than last week's snowstorm here. This ship is magnificent, and we were promised grand entertainments. I got little to eat this morning, the habit on shore being to feed at noon. Here at noon we were set down to a table without a cloth, and with very little on it of any kind. We are a numerous miscellaneous lot, and it was ludicrous to hear the different tongues exclaiming, "Ich bin hungrich" "I'm starving." "I guess this is the meanest tiffin I ever saw," and so on. Two stewards only attended, and the miserable trenchers of sausage, tongue, and thin bread were cleared and replenished many times before we went on deck to smoke and bask in the sun. "I reckon if you put a charcoal mark on that man's face," said a Yankee astronomer to me, "it would

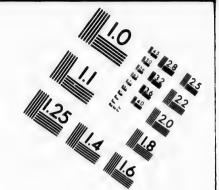
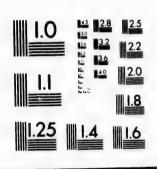


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come out white." So it would, for he was a Nubian stoker. Near him a thin slender Malay or Lascar, or something or other, was shovelling ashes. A lot of Frenchmen danced past gesticulating. A white-haired solemn sailor walked solemnly after them. "Es du Norman?" quo' I; "Oui," said he, but he was a Norseman. Then came by a Chinese man with a pigtail, and a pair of moustaches, shrugging his shoulders and amicably talking good French to the captain. He is a Jesuit, and he nearly made us late for the tide by coming on board at the last moment. A., who started in July when I did, and whom I have been crossing ever since, is on board. And now I have written enough for a while. So, good-bye. Send this to head-quarters; it is my log. Page 180, vol. ii. Love to you and yours.

J. F. C.

## No. XXXVI.

Hong Kong, February 9th, 1875.

MY DEAR MOTHER,

I wrote to ——, and this goes by the same mail I hope. I expected to find lots of letters here. I have found none, and must wait till Colombo. *Vide* "Times."

I am going to Canton, and then southwards, but which steamer I shall take, and which way, I cannot yet tell. I may go to Manilla in a P. and O. boat, and so get to Singapore and Colombo. Meantime, as I have nothing to tell, I shall scribble no more, but go out, and march about these queer streets. The town is like Lisbon, an amphitheatre, but at the base of a tall hill, 2,000 feet high, which I would climb, were it not for the monsoon mist

which covers it and hides the view. Temperature about 68°, light obscured.

People are carried about in chairs on Chinese shoulders, but I who have walked Japan, walk Hong Kong.

J. F. C.

## No. XXXVII.

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Canton, Thursday, February 11th, 1875.

MY DEAR MOTHER,

I left Hong Kong yesterday in a mist, with the glass at 68°. Here I am in drizzle, with the glass below 59°. The voyage up was beautiful and interesting. First a sailor put down an iron grating and a padlock on it over the stair. Then I was aware of a sentry in uniform with a loaded musket, and then I found more of them, and that the captain's pockets were full of loaded revolvers. They explained that no less than five river steamers had been captured by pirates. The last adventure was in this wise. An old man and a young began to dispute on the lower deck of the *Spark* about six months ago. The row waxed furious, and the captain came from the upper deck to quell the riot. The old Chinaman rushed to the carpenter's bench and snatched an axe, by way of striking the young one. The carpenter cried out, "Tie him up."

"Pirates are never tied," roared the old man; and then twenty or more drew long knives from their boots, and went for the captain. He tried to shoot, but his pistol missed fire. Then he ran for the upper deck, but the long knives cut his legs, and he fell. Then they cut his

throat, and the carpenter's, and the mate's, and then they wounded a sailor, who jumped overboard, swam, and escaped with his life. Then they had the ship. The Chinese passengers they sent below, the women they robbed of their bangles, the men they stripped of their cash. They rifled the steamer, and then they went off in the Five were caught, and beheaded here in ship's boats. Canton. I am going to see their heads to-morrow. I saw the Spark all right, steam off to Macao this morning, but with a new crew and captain. For that reason our blue sentry walked the upper deck, and the lower deck was locked with an iron grating, under which were the Chinese. Then we got to the famous Bogue forts, which the Chinese are mending since the Japanese scare. Then we got to sunshine and to swarms of junks, and to pagodas, and to the old port, and finally to this curious old city, with its crowded river and strange sights and sounds. I took my quarters in the "Canton Hotel," kept by a Portuguese. I land at the foot of a stair, walk past a boat in the entrance hall, and up to a first floor with a bamboo stage overhanging the river in front of the windows. My room is a boarded glass-doored place separated from the rest of the rooms and a central dining-room, but open above. Through it the monsoon blows fresh and damp, and the whole is like a stranded ship. I hear the sound of oars, gongs, and crackers; I look out, and see junks with roofs on them, and gardens on the poop or amidships. I get into a house-boat navigated by a pretty little girl about ten or twelve, with bangles on her bare legs and arms, and by an older damsel, and a pale long-legged Chinaman. In a jiffy I am over amongst a population of fishermen, and country

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boats, and boats where people sing and drink tea, and there I see singing damsels, with faces more painted than a clown's in a circus. Then I am among fish and onions, and magic lanterns, and shops, and crowds, and chairs, and coolies rushing and roaring, and then I turn into a temple. There I find more crowds. The last I was in has 500 gilt figures in it larger than life, each with a candlestick and a pot of ashes for burning joss-sticks at his feet. The air was thick with the incense. I got to the high altar at last, and set me down with my guide on a bench, and watched men and women lighting whole bunches of joss-sticks and doing, Then I looked at bronze pagodas and dwarfed trees in china pots, and then I dived back into the toy bazaar, which entertained me vastly. The place was worse crowded than other streets, and the narrow lane of daylight was hidden by red signboards and curious lanterns. Some are fish, some peacocks, some birds flying, all with large glass eyes and a place inside for the oil lamp. Those who purchase hoist their wares on long bamboo rods to keep them out of the crowd, so the air is full of flying fish and monsters. Inside the shops boys are beating drums, and working toys, and making a din amongst dolls and gilt paper, and a mass of curious contrivances, each of which is new to me as to the squalling long-tailed babies who rejoice in these toys and buy them. My guide would not let me buy there or in the street, manifestly because he could not levy his black mail on these wandering hordes. He led me to a sing-song. There I found a large courtyard open to the sky brimful of Chinamen. In front on a stage were actors, gorgeously attired, performing some comedy or other which

I could not understand. But that was something quite new Then we went to a tea-shop, and drank tea and ate cakes for tiffin. Then I was led past shops and into shops, and was aware that I was a subject for plunder, and then I brought my Japanese knowledge to bear, and bought nothing or very little. I might have bought vases for £25 as tall as I am, and ivory eard cases for £1, and ivory boxes for £20, and sandal wood for £1, and jugs for 30s, the set of four, and a brooch of silver and kingfisher's feathers for £1, and so I might have easily emptied my purse. But I was only tempted by one butterfly box and five enamel cups, and there they are on the table telling me I was a gaby to the tune of 10s. What I have got is a whole gallery of mental pictures of life in China as it is, and a thirst to see more. Yesterday I saw a duck boat from the steamer. On each side of the boat are great outrigger baskets, in which the ducks roost. All day long they paddle about in the muddy rice fields, in flocks of many thousands. But when night comes a signal is hoisted and a call sounded, and then the whole band scuttle for the boat. The leader is an old trained bird who waddles up a ladder as fast as he can toddle. The rest follow, and the last are flogged, so the whole rush for the boat. About this time of year they are slaughtered, split, and dried in the monsoon for market. I mean to visit a duck boat before I start.

At dinner yesterday I was introduced to Mr. ——, and we found that we were acquainted at Avranches.

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WATER DRAGON AND PEARL MATH. JAPANESE PRESCO.

The Dragon Myth.<sup>1</sup>—Anybody who choses to look at Chinawares can see that Dragons pervade Chinese art. A particular species is the special property of the Emperor. Nobody else in China may lawfully own China-ware adorned with the portrait of that particular heraldic beast. The Empress only may own china adorned with Butterflies. Knowing this, I have always wanted to learn Chinese Dragon stories. Accordingly I tried all I could at Canton, and came bad speed. One Englishman who knew Chinese well told me that books are full of Dragon stories. He promised to look them up, and send me a lot. One he remembered, and that is all that I got.

There lives in the sea a great Dragon, who keeps in his maw a precious pearl. When he is in the humour he pokes up his horned head, and his four legs and tail roll about while he blows out his pearl, and makes it dance like a ball on a fountain. If any man can see that pearl, he becomes a seer, and knows the future. But that Dragon is very cunning. When he knows that a man is near, he sucks in his breath and his pearl, and sinks.

<sup>1 1.</sup> See twenty-four volumes of Gaelic Popular Tales, orally collected in the West Highlands,

<sup>2.</sup> A manuscript volume on "Oral Mythology," written 1869-70.

<sup>3.</sup> A manuscript volume, "Celtic Dragon Myth." English translation, and notes. Bound February 1870.

<sup>4.</sup> A MS. collection of Sinhalese Popular Tales, gathered from various sources in Ceylon, by G. W. R. Campbell.

 $<sup>{\</sup>bf 5.~A}$  collection of Japanese Toy-books, containing stories illustrated. Collected 1875.

Several shelves of printed books and MSS., containing published collections of popular tales, and essays on the subject by numerous authors.
 All at this date, January 1, 1876, at Niddry Lodge, Kensington.

There is not much of a story in that. A theorist might call the Pearl the sun, and the Dragon the sea out of which the sun seems to rise off China. But then everybody sees the sun, and everybody is not a seer. The usual solar myth is made to turn upon the setting of the sun in the western sea. But if the solar myth grew in Central Asia, the sun must have seemed to rise out of a dry plain, and set in it, or to rise or set amongst mountains, or marshes or lakes. The chief characters in the Dragon myth are a man, a woman, and a sea-monster. The explanation makes the woman Dawn, the man Day or the sun, and the serpent Darkness or storm. I have watched Dawn from many a strange bed out in the wilds, and never saw how a savage could turn growing light into a woman. Dawn has no shape. and moon have shapes like faces, and they have been personified as gods, male and female, about whom stories are told. Those which I learned at school made the sun a god, whose human semblance is in the Vatican. The stories which I have learned for myself often make the sun a woman, and the mother of mortal men.

"I want to know" whether the woman rescued from the Dragon by the man, may not have been a real woman, offered as a sacrifice to a sacred serpent, or alligator, or shark, or whale, by those who built snake temples along this Asian coast; and whether the hero was not an ancestor who saved the woman's life, and was promoted?

Whatever be the answer, the Pearl Dragon is a favourite subject in Chinese design. In Japan I bought, in a rag-shop, a Chinese dress, embroidered to represent waves, a sea-serpent, like the creature figured by Pontoppidon, Bishop of Bergen; the dragon's four feet and claws and his horned head and goggle eyes blowing out the pearl. He is surrounded by flying things, which may be birds, bats, or butterflies, or flames. In the Tartar quarter in Canton I found similar designs sketched in black on white walls opposite to the quarters of generals or officials of rank.

I tried to copy one of these pictures, but it was difficult to draw, especially in the middle of a dense, dirty, rude crowd of street-boys and rough soldiers, and beggars. Such as it is, the sketch has been facsimiled. Compared with Japanese sketches, it appears that the conventional Dragons are the same in many ways.

I want to know what they were.

One of the famous temples of Canton was called that of the "five lamps" by my guide. I found from a book that he meant to say "five rams," and could not pronounce the word. I went there and found five stones upon an altar. So far as I could make out in a dark place on a grey day, these are the fossil-head and four bones of a great Saurian turned to red sandstone. The equivalent of an altar-piece behind the holy stones represents a Saurian Dragon in black and white. with teeth and claws. Under Canton, its mud, and the Pearl river, are beds of red sandstone. Near the temple of the "rams" a bit of the rock is kept bare to show the sacred footprint of Buddha. All that I could see was weathering. But when I was a child, I used to go to look at a hollow weathered in a block of stone, which my nurse and I called "the giant's footprint." We invented that legend; the shape of the hollow suggested it to us, and shape appears to have done as much for other myths at the other angle of the old

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rite hop, ent, gen; world. Is not Adam's footprint at the top of Adam's Peak in Ceylon? What was the mythical Chinese Dragon, who is here associated with Buddha, and who is said to be swallowing the sun during an eclipse? In Japan he wanted to swallow a woman, who is in the family-tree of that Mikado, who is descended from that Sun, who was a female divinity. In China I find the sacred fossil bones of a Saurian in the chief temple at Canton; the Pearl Dragon of the sea painted on the walls; and an Emperor and Empress related to the sun and moon, whose devices are Dragons and Butterflies. The story must be somewhere. I do not yet know enough to see my way, but I seem to see that man, woman, and dragon in popular myths were man, woman, and reptile or ravenous fish, before they became kami and gods and the sun and moon of mythology.

New-Year's Customs.—In Japan, where people are reformers, I had a vague suspicion that new-year customs which are like our own might be imported. In China, which is Conservative, I saw that the new-year customs of East and West must have grown independently. New style prevails in reformed Japan; old style survives in Chinese dates; so I had a series of new years on the Asian coast, and their customs were alike. Everybody must square accounts, pay debts, and balance books or forfeit credit in China; so the national stocktaking corresponds to our "Christmas bills." We decorate shops with evergreens. Every Chinese shop has a kind of family altar set up in it, decorated with paper and gilding, set out with fruit and flowers, which are new-year's offerings to some divinity, or to the manes of ancestors. The reason varies, but the

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custom is the same as our own. It is a time of festivity in England and in Asia, when men sing and drink strong liquors, and give gifts, and make ceremonial visits, and leave their cards or send them round. The card of the Chinaman is a grand affair, but the French custom and the Chinese are the same. The new year is a festival, and the festivities are the same in kind. The rich Chinese give theatrical performances gratis. All who can afford it give gifts to children. Nobody works that can afford to take a holiday; everybody that can take a holiday enjoys it according to his taste. He invites, and is invited; feasts, and has a jollification. It was amusing to watch a door open and to see a whole family of Chinese ladies doing the civil to a whole batch of lady visitors. No interpreter was needed to explain the looks and actions of these polite persons of rounded outline, with their painted faces, and feet like the knob on the end of a wooden leg. It all meant pretty manners amongst kindly neighbours who had been paying "the compliments of the season." Some kind of Chinese religion is mixed up with the season. The Hong Kong junk-men seemed to purify their boats with fire and incense. Some one recited something, and one stout mariner banged a gong for ten minutes while I looked on. The temples were crowded in Canton. Grand ladies went through prostrations careless of the crowd, and devoutly cast offerings of inscribed paper into a fire prepared for the purpose. So our Chinese passengers cast gilt paper to the winds of the Pacific, which fluttered away in clouds, -offerings to their gods. From the day of my arrival in China till I left it, a running fire of squibs and crackers made day and night resound with new-year rejoicings. The VOL. II.

streets of Canton were littered with the *débris* of burnt crackers all the time I was there. But the Japanese Torri of two green trees with a rope between did not appear in China. Nobody ever told me about these Eastern customs; they may be news to others, so I add these notes to my letters.

One other point of resemblance struck me. Late in 1873 I was at Pisa, studying the pictures on the walls of the Campo Santo. Early in 1875, my guide led me to see a set of carved models in a Buddhist temple in Canton. They represent the tortures that Chinamen inflicted on each other, in fact, promoted to the future life of their ill-doers. It is hard to say which artist had the stronger imagination or the worse models. Christians and Pagans have tortured each other as much as they possibly could, and these realities inspired art in the far East and the far West. The Campo Santo was empty when I was last there; the Canton "temple of horrors" was densely crowded. Beggars, numerous and importunate as Neapolitans, swarmed there; soothsayers plied their trade, and reaped a harvest; countrymen gaped and stared. But in the midst of all, earnest men and women prayed with heart and soul; and let us hope that their prayers were heard, though ill-directed.

No. XXXVIII. On Board the "Hydaspes," China Sea, February 19th, 1875.

MY DEAR MOTHER,

Page 197, vol. ii. Log.—It will save time and trouble if you will get my letters copied.

I have to write under difficulties, and I can hardly read my own hand. I am writing now on the top of a

camphor-wood box in my cabin, and the old screw steamer goes jiggety-jig-joggle. Truly this is a wonderful change. Up the river it was cold and disagreeable. We crept round the fire, and the monsoon whistled and sang through the house all day and all night. I was glad to wrap my plaid about me outside my thin sheets and blankets, and I never saw the sun for a week at Canton; 49° was cold for the tropics, and I was cold. On the 14th I went down 100 miles to Hong Kong, and found 62°. The glass had ranged 10° warmer near the sea all this time. On the 18th we whisked round the island and got clear of the fog. The sun shone, the sea was bright blue and green, and the hills the colour of sunlight on barren red sandstone.

Brown butterfly sails over strange junks flitted all about, and spray glittered, the sea danced, and we were in summer weather in an hour. This morning we are in the warm stream of the Pacific once again. My bath of salt water was 74°, and the air is 76° in my cabin, and 73° in the coldest place I can find in the ship. Here I am without any coat, listening to the crowing of cocks, and the cooing of pigeons, and the lowing of cows camped about the main hatchway. I look out of my port, and there is the crisp blue Pacific, and the north-east monsoon driving me from China to Singapore, or somewhere else. All this time you are cowering over fires in fogs, and shivering in Old England, and I, globe-trotter, have got the best of it for the present. I got your communication of the 10th of January on the 15th February, at Hong Kong, with the Times to the 8th January; and now that I am clear of China, I may express my opinion, which is that Chinamen are rogues of the first water. Everything is

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hardly p of a sham, and costs a dollar. Every man is engaged in "squeeze." If I buy, my guide gets 10 per cent. from the vendor, and cheats me in change. If I buy a camphor-wood box for two dollars and three-quarters, a man tells me that real camphorwood boxes cost 10 dollars, and that mine is oiled with camphor-oil; I believe neither. One wanted to sell me a box for 10 dollars, the other puts enough of real wood in his box to make it smell nice where it is planed and scraped, and possibly may oil the rest. In any case I shall presently send you home a camphor-wood box, full of curios and shavings, and time will show whether it was worth one and a half dollars or not. It looks like old chests made new, and it probably contained deceased Chinamen at some period of its existence as a box. That is a sample of Chinese dealings. The other day I took a fancy to buy a blue silk long Chinese coat to smoke in. I found a shop full of the articles old and new; my guide did all he could to get me out, but I was obstinate, and would not budge. The whole shop was gay and gorgeous with pommelos and oranges, and gold paper, and new year's decorations, and the owner looked jolly. I tried on garments new and old, and a great crowd in the street looked in over a carved rail, and laughed and railed at me when I was arrayed in their garments. At last we got to the price. It was 17 dollars. That of course was absurd; I offered My guide interpreted. At last I said, "Tell the gentleman when I say 12, I mean 12, and if I go out, I will not come in." The guide interpreted with strong emphasis, and presently I walked off with my purchase, £2 10s. poorer, and a blue robe richer. Achin, my guide, was servant to Archdeacon Gray, who used to show people

about Canton for love. The man does the same, and me he charged one and a half dollar a day, 6s. 6d. At first starting in the boat to cross the Pearl River, he said, "I always take a chair." He walked once with some Englishmen, and he was mso tired that he could not work next day. I grinned inwardly, and walked him nine miles about the streets. "You get an oble guide," quo' he. "Very well," said I. Next day I gave him another march, and the last day I gave him such end a tramp that he limped in his China shoes. Each night he said that he would not come again. I told him that he had my free permission to go to the D——l. Each morning he came, and each day, all day long, I walked after his long tail, and took a vicious pleasure in avoiding "chairs," and in refusing to buy anything at any place to which he led me. t to I could hardly get him back to interpret when I stopped. "Ole man walkee slow," he said to Colonel B., who walked with us one day. By the way, I must be getting old to look at, though I don't see much change in myself of late. A Chinaman, after stroking my beard and hands, asked if I was much over 60? I confess to 53, and feel like walking Achin off his slippers. "Pigeon English" amuses me greatly. en I All It's become L's. "What are those cakes," quo' I. "Boiled lice," said Achin. "That is Lady Camphor-wood box," said Achin, and I thought it was some female box, but "lady" is the Chinese English for really. Yesterday, A. did not appear at breakfast. Captain B. asked a Chinaman where he was. "No. 46 go back," said the long-tailed waiter. Then he threw himself back and shut his eyes, and we understood that No. 46 had gone to sleep again, and sent to call him. When ople A. was almost late, his guardian genius said, "You no packee

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—— No. 45 one piecey man long time walkee," "What time shall we get in?" said a Briton to a pilot. "I thinkee No. 11 can do." I was civil to my waiter at Shanghai, and gave him a tip. "Good-bye," I said. "Goodee-bye, ole man, take cale of ooself," said the waiter, quoting some traveller, and I departed giggling. But nevertheless I was "Ogee San," "the old swell" at Yokohama, and I must be "lady" getting old at last. My name is carved on the top of my camphorwood chest. I carefully said "kam-bell." I asked a man to read the characters carved, and he read "gum belly." The gunner has been in to look at it, and says that it is genuine, and as pretty a bit of camphor as ever he seen, and "lady" very cheap; and he is a Briton, and him I believe. I did not see one single bit of genuine old china in Canton. at all the old streets, stalls, and strange shops, and eatable stands, and not one single scrap of old china did I discover. But I was told that two Frenchmen, who seemed to know their trade, had bought hundreds of dollar's worth of old china for the French market, and hoped to realize thousands. I pity the French. Silks are sent from France to get the Chinese marks, and return to be sold in Paris as Chinese silks. A merchant engaged in the trade told me so. Ivory dust is squeezed with glue into moulds, and the result is an ivory figure, sold as carving. Porcelain is sent to Canton from Germany to be painted by Chinese, and to be sold as china. In short, the whole of this part of the country is one great sham and swindle. But the people are not so bad as they have been called. When I stopped to draw or glower, a crowd gathered. I had hundreds about me, staring right into my eyes, examining my clothes, and behaving with extreme

lack of courtesy. But I gave one fellow a pinch of "baccy," another a light. I grinned in the greasy face of another, and said "Chin-chin," and I doffed my wide-awake to a greybeard. So not one ill word or deed fell to my lot in Canton. I believe that small boys did call me a "Fan quai" (foreign devil), but acting on the counsel of Mr. Brown, I replied "Tong quai" (China devil), and we were quits. As servants they were quite excellent. You see a long-tailed, patient, pale man, carrying about a child all day long, and the child gets quite fond of him. Labourers, sailors, navvies, &c., can be made out of Chinese coolies at once. It is a caution to see two little men running up and down Hong Kong with a big Briton on their shoulders in a chair. I respected the Chinese, and not wishing to be lowered in my own esteem, I never was raised on their shoulders, but did walkee walkee there. The women work like the men, and are equally polite. "I velly solly you go away," said the boat-girl at Canton to me. The Hong Kong Sampan that brought me off was managed by an old woman, with a baby slung on her back. As she stood and rowed the after paddle, she rocked the cradle of nature, and the baby looked over her shoulder and went to sleep. Forward were two children rowing right well. In the bow was a single grown man; somewhere under hatches were more of the Fancy A. with her youngest on her back working a heavy oar in the biggest C-- boat, and Nelly and Walter pulling bow-oars; that was about the size of my Hong Kong crew. I need not add that I paid them double fare, and that they all said "give me more," and that I said "Chin-chin," and did not. So my impression of Chinamen is that they are industrious, laborious, persevering, hardworking, patient,

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mercantile, rogues, cheats, and humbugs. It was quite refreshing to fall in with an ugly little pepper-pot of a Japanese at Hong Kong, and get his real prices at once, and recognize that they were fair prices, considering the distance and the profit. It was pleasant to ask, "Have you got any old things?" and to be answered at once "No, all these new;" yet there were vases like those which Chinese wanted me to buy as old enamel, and which I knew to be modern Japanese, made at a town which I passed on my travels.

So I prefer Japanese Radical Reformers to Chinese, who are the most conservative people in the world. Tell W. D., M.P., with my kind regards. Meantime, once more "Chin-chin." J. F. C.

P.S.—77° in my cabin, and tiffin time.

No. XXXIX.

"HYDASPES," AT SEA, Wednesday, February 24th, 1875, Lat. 4° 36' N., Long. 105° 11' E.

MY DEAR MOTHER.

On Tuesday the end of the piston rod slipped through a nut and we broke down. There we lay. Thunder growled, rain poured till it roared on deck, like a torrent of French drumsticks, beating our big kettle-drum. The sun came out, and we sweltered in heat. A shark came under the stern, then more, then a flock of them, great and small. We counted ten. We fished for them, but no; they were waiting for us. We set sail and made 25 miles in 24 hours. The engineers disconnected the engine, and then tried to make one turn the screw. It hissed and roared, but it never got

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over the dead point. Omen of our approaching fate. Then the engineers fe'll to hammering and boring holes, and their crew of dark Africans hauled and worked, and sang wild melodies below, which ended in hissa. I lay on a bench or in the arm-chair of some more provident passenger, and read Pelham, and thought of little Snow-white and the bears. "There's some one been sitting in my chair, and he's sat the bottom through." At food time we gathered dismally round a table over which wagged a web of brown holland hung on a pole, which a rope and a dark-skinned graceful boy caused to wag to cool us. The brown boy in white clothes with a red turban on, swang gracefully to and fro in a brown doorway hung with green curtains, and looked a picture. He shifted his rope from hand to hand, he shifted his weight from foot to foot, he bent his knees, and folded himself up in a heap on the floor; but whatever he did gracefully, he pulled his rope like a darkey on a clock, and the brown holland web wagged on to cool us. But we were deadly slow. We went on deck and smoked. I went to bed, and near me children wailed lamentably, cocks crowed in their coops, ducks squattered in theirs, geese cackled, sheep based, an old cow lowed; but the cook was waiting to execute them in turn, and the cow had tried to commit suieide by eating a large bundle of oakum. So I sweltered and dozed, and dreamed dreams suggested by the sounds and smells of the farm-yard. At dawn I was up and into a bath of salt water at 80°, the coldest that could be got. 1 went on deck, and there we lay swinging in the swell and fanned by the N.E. monsoon. I looked over the stern. There, far down in the bright clear blue sea, gleamed white and glistening a large

square fid of fat pork. There, close to it, a long brown ghost of a fish wagged his tail, and waved his fins in derision. He knew better than that; he was waiting for us. As I was waiting for breakfast, as the cook waited for the innocent baa-baa's and cock-a-leerie-laws in the farmyard about my hatchway.

I finished Pelham, I got some mud from the bottom of the sea, and examined it, and could make nothing of it. I went below, and made curves on bits of paper to represent temperatures endured; culminating in this temperature endured at 80° everywhere. And then I sat me down to tiffin, and ate salmon, and thought of the Arctic circle. When-hooray! the screw began to turn, and off we set clattering as before. The engineers have bored a big hole, and they have stuck a steel peg through the piston rod. They have screwed up their steam boxes, and opened their steam pipes, and we are off from the sea of sharks to the land of cakes, or to some other land of promise. Broad grins broke out on every face, beer choked voices that would have cackled for joy. We ate our tiffin, and I sat me down to write a letter, which will go in this ship, and ought to reach London before the end of March, unless the ship breaks down again.

J. F. C.

No. XL.

SINGAPORE,

March 4th, 1875.

MY DEAR E.

As this is to be horticultural, I write to you. ——made me dine with him at five on board of his French mail boat, made me drink champagne, and then dragged me

about in the dark to visit various ships, over gangways, and through mud, ropes, and chains, into dark, hot, disagreeable cabins. Then he led me to shore, and after various footbreadth escapes I got my galley (i.e., cab), and got back to my inn. We are going off to Java to-morrow. I shall not stay long there. I reckon. It is the rainy season, and hot and misty, as this place is: 79°, 80°, 85° are the temperatures here in my room-morning, noon, and night. Every day it rains, sometimes it pours; everything is damp and sticky; every place that anything can grow in is green. Every place that a frog can float in is sonorous after dark. When the rain pours, the frogs roar in concert with it, and the row is tremendous. A continuance of such a tropical climate causes vegetation to flourish, and people to strip. The trees are clad in vivid green, the people are denuded, black, brown, and yellow and white; quaint to the extreme of quaintness and the verge of decency. In front of my house grow trees that I cannot name. One grows up like a spike, opens and drops a pair of long arms with flat leaves for fingers, and then drops another pair, and another, and another, until it takes the shape of a big fan. I rather think it grew in Hyde Park last summer, but it was small there. is a great green tree, very pretty, and strange to my eyes. Then come betel palms, tall fishing-rods with big knobs for roots, and a feather on top. Then pines stand on the ridges, and look like Chinese pagodas. I strongly suspect that they suggested that style of architecture to the Chinamen. Bananas, with their big leaves, grow in the gardens, and by the sea. Mangroves, with quaint skeleton roots, crawling all about like vast spider crabs in the coral muc, with a

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tall tree and green leaves on the back of the monster. I went and sat on one of these claws and sketched, with a fishy damp smell in my nostrils, streaming with heat under a Japanese 'brella. I have not got a fever yet, but I own that I merit one. Yesterday I got a boat at the landingplace, and was paddled to a Malay village on an island. That was a different scientific study of a Pfaul Bauten, and more in my line. A forest of poles are stuck in sand where the water is four or five feet deep. About ten feet above the sea is a grating of planks and bamboos, and rickety wood-work, and the scaffolding is made into a house with leaves and wattle. Inside are mats, and naked brown children sleeping on and under them, and all about on stages are nets and fishing gear, and great tubs full of stinking shells of wondrous size and beauty, preparing for the market. I bought two, and they are pestiferous nautili. The master of this house is a brown Malayman with black hair, who comes alongside steamers and ships, with a couple of boats filled with shells of all sorts, sizes, and colours. They really are beautiful floating shops of red and white corals, and marvels of the sea. But I cannot think what to do with fragile tropical shells, so I have bought none. We got our boat under the shade of a house, and I sat and made a sketch, for which I deserve another fever. Groups of brown Malay children gathered about us on the poles, and piles, and stages. Sampans came gliding noiselessly in, paddled by strange, grave, black-haired, amphibious critturs, who grinned at us with their beautiful white teeth, and presently climbed up a pole and disappeared in some house or other. Then out of a black doorway came a draped figure in brilliant



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MALAY PHIE VILLAGE NEAR SINGAPORE

colour, and spread out the washing to dry. The brown and vellow stage blazed with more colour. Then the sun got right overhead, and the eaves cast deer shadows on all the walls, while the roofs shone with sunlight on leaves and basket-work thatch. Then it pleased the juvenile population to take a promenade; splash, plump, down came a brown shower of boys and babies, and the green sea about our boat was full of heads and bodies, legs and arms, playing like a shoal of seals in the shallow hot-water. It was over 80°. I believe 85°. Then they got tiny boats with sails, and then a wretch about six got into a canoe, kicked out the water with feet and fins, and paddled away to the sea. I asked the Malayman if his father was a fish, and he grinned placid approval of the joke. Meantime, I worked away, and the result I hope to let you see. It was a hopeless subject, but while I worked I took in the ways of a pile village, and learned how men of the Stone age lived in Swiss lakes and in cranogues in Scotland and Ireland long ago. I was pleasantly instructed, but the sun scorched my feet through my shoes. As for A, he too worked and was warmed. Picture to yourself this venerable form pacing over a narrow rickety plank, holding the cold fishy hand of the shell merchant, and tottering to my fall in pursuit of knowledge.

On Monday, I dined with Mr. Wampoa, a well-known Chinese character, who used to entertain Sir Harry Keppel. Send this to S., and tell her to tell the Admiral that I saw his picture hung on the wall greatly prized. I boasted of my acquaintance with the original, and was all the more welcome. The object of the dinner was to study the Victoria Regia.

Many green sponge-bath leaves cover a long sheet of water in the garden. On Sunday a crop of lilies came up out of the water, and spread on it a beautiful pale vellow. On Monday they were white. On Tuesday we went to the edge of a big ditch at half-past five and watched a flower open; it was as big as a full-sized artichoke. Slowly and gradually leaf after leaf fell back, and gave way with a sudden jerk, and then a burst of perfume spread all around; it was like magnolia scent, but stronger than any that ever I smelt. Then another leaf and an ther opened, and each scattered a cloud of scent that filled the air. Each leaf got more and more crimson; at last the hard, central leaves in a ball shone bright crimson in the centre of a great white and yellow and purple flower a foot wide. Then we went to look at the pig with one head and two bodies, and the tortoise with six legs, and the orchids, and the China monsters, and the Chinese curios and Jade-stone, and then we dined to the music of frogs. After dinner a servant brought me the Victoria full-blown, I carried him home, and at early dawn I got up to take the picture of my present. I sat down to do a quiet bit of still life; but by the time I had got the flower measured and drawn, I found that it was all in motion. It was shutting-up at sunrise; I had to wash in colour as fast as ever I could, and so I failed to make anything good of the form. Such as I did draw, I hope to show you some day on the fly-leaf of an atlas. I have nothing else big enough to hold my flower. Now it is a purple, drooping, withered-looking crittur, with a red artichoke tight shut about the seed, which is forming inside. I mean to bring home the remains of the flower,

together with those of the shell, and their bouquet will be lelightful no doubt.

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iner, A crop of mildew has grown in my sea-chest, and that I am now going to harvest and dry in the sun, so I shall pause and f.ed before I write more. Oh the mess that all my things are in! Shoes, coats, skins, everything green with mould. I put them carefully into a camphor-wood chest to protect them, and this is the result. The smell means sap and green wood, and this heat has bred a large crop of fungi. Luckily, nothing that I have is worth much.

I have fallen in with an Arran mar, MacAlastair, who speaks Gaelic, and is a ship-chandler. We have fraternized greatly; also with one, Dr. A., from Campbeltown, who introduced himself to me, and set his orderly to watch my door. That is necessary, for this is a den of thieves. We sat and smoked opposite to our doors some days ago. There is a back door which was not well fastened; when A. went into his room again his watch and chain had walked away. There was a green smear of paint on the door, which indicated a China-painter, so the police carried off two Chinese painters with green hands; but the watch has not returned to its disconsolate owner. The police magistrate was driving in a carriage not long ago-a thief came behind, and stole his hat off his head. Lots of other people have been robbed in a like manner, and so I was glad to be protected by a dark soldier in a turban.

I shall go post this now. I am hot and damp, and all the starch is out of me and my shirts. Good-bye.

J. F. C.

No. XLI.

BATAVIA, JAVA, Monday, March 8th, 1875.

MY DEAR MOTHER,

On the 4th I went on board the Neva at Singapore, and after some trouble got leave to dine there. I went to bed, and presently I heard a British voice say, "I wants a cabin for (some friends of mine); I goes second class." In the morning, there sat the lady to whom I was presented at Lisbon in 1841, reading a book. We had a deal of talk about our friends in England, and about our mutual travels and several adventures. We had strange weather: it was hot in the air—80°, with occasional drops to 75°; the sea was 82°, 83°, 84°, and the sky at night was chiefly lightning; now and then we got under a cloud, and then the rain came down like a waterfall. Some of the men slept on deck, under the awning, but when the first deluge came down it came Then they bolted in, and passing an open place got through. drenched. I slept in the saloon, and there too the water came; I got up to seek a dry place and met the drenched men from above. If they had bathed in their clothes they could not have got wetter. One result of all this sky-pouring appeared in the sea, in the form of palm trees swimming about with roots, trunks, and branches, swept bodily into the sea from some river in Sumatra or elsewhere. They were going north towards Japan, and I was running before the Polar wind which I fell in with at Shanghai. Here I am south of the Line for the first time in my life. I am getting so used to queer people that I have ceased to wonder much. Here are Chinese, Malays, Javanese, Dutchmen, and Scotch75.

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men, and cross-bred critturs of all sorts and sizes—Eurasians they call them. The Malays are ugly, and affect a dress which partakes of the markings on a snake's back. The Chinese are chiefly born here, but they are like the rest of their people in America, and Canton, and elsewhere.

That which most interests me is the tropical vegetation everywhere. It is strange and beautiful. But that which Wallace remarks in his book I remark. It is all dark-green, without variety. Flowers there are in plenty, and the air is full of their scent at night; but they do not show in the dense dark-green. The trees are everywhere; they come right into the sea all along the coast of Sumatra, and the mirage made them appear to be growing out of the sea. Every reef and small round dot of coral island is covered with dense jungle as green as the jungle on shore. heat and the rain together make trees flourish and men wither. On Sunday we went into a green swamp to hear the band play on a dry place. The rank, beauty, and fashion gathered, and I sat on the box of a carriage and made caricatures. In front of me sat a Malay coachman, with brown skin, dark eyes, and black hair, very like monkeys whom I have known at zoological gardens. His coat was sky-blue, his shirt white, round his head was a turban of a general yellow colour. Perched on top of that was a ludicrously tall black hat, straight as a stove-pipe, with a flat brim, and a broad gold band and pendant ends. He sat straight as a poker and grave as a judge. In the carriage were Malay swells, in all the colours of the rainbow. Presently, trotting in excellent time, with his tail on end, a small piebald pony whisked past, ridden by a big Dutch officer, doing la haute

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volée in and out among the carriages in uniform. Then a band of girls in evening dress, low gowns and low shoes, and hair down, black, yellow, and brown, paced along the green grass, and carried me right back to long ago and far away. Then a man in a Scotch bonnet crossed my line of sight, then a lot of young brown Java lads in white, smoking without hats. Then a Malay man leading a little white Dutch child; then big Dutchmen, with a yell " beard, followed by a troop of children in various costumes, some European, one Eurasian in red draperies, with a brown skin. Then the sun went down, and the clouds turned red, and the green grew suddenly dark, and we went home to dinner. There we got Lenten fare, cold comfort, and little of it. "We," by the way, are three just now. At night I slept as best I could, and at dawn I was up and into a marble bath under a , waterspout, which is the pleasant time of the day. Everything is span new; the crows croak a new language; a bird is singing a song that I never heard; flies are lit up for the evening, and come and bite me as I write. Impudent dogs, with curious curled tails, trot about, intent on their own affairs, and pay no heed to whistling, and calling, and coaxing. When they meet me they growl. At early dawn everybody came out into the veranda, and sat there in light costume, drinking tea and smoking. Presently, arm-in-arm, a honeymoon pair, in pajamas, barefooted and slippered, passed us all, and vanished into a marble bath. When I came out of mine they passed arm-in-arm as before, and vanished into their rooms, looking as cool as their costume and their proceedings. They are fearful spoons all day. My neighbour is a Dutch lady with a great deal of hair. She came

out in pajamas, and sat in an arm-chair. Her man is a merchant, with many boxes piled about his door. And here I sit, while our lot sit at my door and jabber, smoke, read, and bargain with Chinamen for boots and coats and brown Windsor soap, and cotton socks, and Japanese curiosities, and buy nothing. And now I too must go out and do something in the cool of the evening with the glass at 80°, and the air dead calm, and so for a pause. Good-bye.

J. F. C.

No. XLII.

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Buitenzorg, Friday, March 12th, 1875.

MY DEAR MOTHER,

On Tuesday, the 9th, I came up here, forty miles by rail, in a bright sun, with the hills clear. I have a general impression of a flying panorama of palms and bananas, and paddyfields, of a red volcanic soil, of volcanic cones with white clouds and a blue sky, of red-tiled houses among the greenery, with whitewashed walls lit up by the morning sun, of brown people with few clothes, with great hats, and bits of colour about their draperies; and for geology, rolled stones about the size of potatoes. I got in here about ten, and at noon was sent for by Mr. Fraser, who gave me a magnificent spread. Then it pleased mine host to introduce me to the Governor-General. He wrote, and I went to be presented next morning. Then I was asked to dinner. This island is full of West Highlanders, and people who know me and mine. Islaymen are all over the place. The result is that the Governor-General has given me an order for post horses free, gratis, and for nothing, and letters to all the

residents. The consul, Fraser's nephew, is to lend us a carriage, and we are to travel through Java in state when we can start. But that seems difficult. We have been going off ever since we came, and we are not off yet. This is a beautiful place. From my room door I look over a red river, and a plume of cocoa-nut palms, and a forest of tropical trees at a volcanic cone, "Salah," about 7,000 feet high; over the shoulder of it peeps another volcanic cone, exactly like my models. The clouds came down when I began to draw on Tuesday, and the clouds are on the top of the mountain now on Friday. Now and then the cloud covering comes down, and the points of the cone come through the grey blankets which are spread along the hill-side, and turn to grey gauze, and gather into cotton wool and eider down quilts, and then turn to tropical rain, and run down the red river, sweeping mud into the coral sea. It is all very pretty, but anything less like my notion of the tropics I could not well imagine. It is more like Inversry in the rainy season, but warmed up to 75° and 80°, and dark, and damp, and smelly. Every night when the sun sets a single voice in the forest begins to sing vespers in the shrill continuous metallic ringing call of the cicada, or the tree-frog; I don't know which. The single voice seems to rouse the choir, and they chant a chorus which swells to a great roar. and spreads over the whole land. At seven that choral service ends as suddenly as it began. Then for the rest of the night crickets sing their shrill songs, and frogs croak and squatter, the river murmurs, and the wind sighs amongst the palm-trees, Malay folk beat drums, and make music in their fashion down below, and so the night is sonorous. Chirpin

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lizards live in our veranda, and run about the walls and One came down to look at A., and got close to his ear last night. When we turned to look at him he fled up the wall and chirped. Red ants also live in our They come up from the boards, climb chairs, and never stop till they get into my hair and clothes. They tickle and bite, but do not hurt much, and I am getting quite used to them. I found a great creature two inches long in my basin yesterday; I took him to a Dutchman, who said "He is not dangerous at all, he is a cricket." I turned him over the rail into the grass, and gave him his life and liberty; no doubt he sang in the evening concert. Then at dawn, or long before it, cocks began to crow, Malays began to knock at our doors, and gradually the whole veranda full of people get into arm-chairs, and there in the darkness they sit, limp and half clad, and sip tea and eat rusks, and generally do nothing for some hours. Then at noon they eat a large breakfast en négligé, that is to say, half clad, with their hair down their backs, and then they deliberately go to bed and sleep for three hours. Then Malays knock at doors and distribute five o'clock tea and rusks, and so matters go on as before till dusk, when people dress in gorgeous attire, and go out promenading and visiting. At seven or eight they dine, and they seem to go to bed as soon as they can afterwards. Where such is life, how I admire the energy of those who make money and conquer countries and govern them! Down below in the red river are troops of brown natives in clinging wet sarongs, splashing and washing their black hair, and getting into groups and heaps, and rubbing each other down on the bank under the palms. They are not hard to

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govern, I suppose. When it rains, as it does daily and hourly, the naked gardeners get under trees and cast fishing lines into ponds resplendent with Victoria Regia flowers and green with their leaves, and adorned with black swans. They never seem to catch anything, but they have hope, and they are happy. The great sights here are a spring and the garden. The spring is cotta-butta, or some such name; it comes out of the broken crater of the volcano and is 72°, because it comes from the clouds and the high grounds. It is as clear as crystal, and into it we plunge, and swim, and dive, all for the small sum of 50 cents. The garden is described by Wallace in his book, and to that I refer you, if you want to know more about it than I do. I delight in it for its beauty. The ferns are in groves, twenty to thirty feet high, like F--'s big fern at Campden Hill, but more flourishing. Small ferns and strange orchids are planted on the trunks, and fresh water purls about among the stems and leaves. I fancied myself an ancient fairy in the bracken, and looked out for white rabbits of corresponding size, but I saw nothing bigger than vast butterflies. A little way on is a banyan-tree. It has great claw-like roots creeping all over the place for a great distance, and a fagot of trunks from which spread gnarled limbs, from which drop more trees and roots, and bundles of grey-barked stems. I mean to go to try and sketch that tree presently, if the rain will let me. Then we came to a whole forest of palms of all sorts and sizes, then to a tree which drops a shower bath of roots in the air, then to one which hangs long cords from the branches with a thing like ginger-beer bottles, and seltzer-water crocks at the end. Then we got to gutta-percha trees, and to trees with names

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as long as they are, of which I know nothing. But all these trees drop seeds and fruits on the paths, and we pick them up and sniff at them, and wonder if they are good to eat. Yesterday I was there with A. He picked up a beautiful pink, red and yellow thing, shaped like a large fir cone. He nosed it, and yelled with horror; I cautiously sniffed too, and was nearly sick. Then it came on to rain, and I sat on the root of a bottle tree under a Japanese 'brella, and glowered and wondered at the Victoria's in the pond. So this wild garden is like a natural jungle, with a river in it, and with distant views of volcanic hills and tropical forests. It is the most beautiful thing of the kind that ever I saw. But for the rain and damp heat, it would be delightful to be lazy here at Buitenzorg.  $\Lambda$  tiger came to the garden some time ago, and stole the Governor's deer. The country was roused, and the robber was slain. The jungles are full of tigers, and rhinoceroses, and great snakes, and curious game, but at this time the grass is said to be six feet high, and he who sleeps in it has fever. A. wants to shoot, but he is getting choked off; I don't. And now I must go post this letter. If we get a carriage, three mean to go together to Samarang. After that I don't know what I shall do; I will write and tell you. Do you write to Colombo, or telegraph there, for I expect to be in Ceylon at the end of April, and till the middle of May. Advertise in the Times as usual. I am sure to get that news at all events. If I do all that people want me to do, I shall never get home, but go revolving round the globe till I go out of the world. In any case I do not expect to get home now till July. This is my portrait: a pair of yellow Constantinople slippers, a blue silk Canton Chinese robe, a head much as it was when I started; "a general air of refined repose." I have been reading a novel. Now I must go.

J. F. C.

No. XLIII.

BUITENZORG, JAVA,

March 14th, 1875.

MY DEAR K.,

This is the grandest horticultural place that ever I was in. The Governor's garden is described in a book about the Eastern Archipelago by Wallace, the great naturalist; to that I refer you for science.

Yesterday Mr. — came for me at dawn, and took me to the house of a gentleman who has zoological tastes. He had lots of birds; amongst others a couple of baioos, they are black with red bills and coloured wattles, and belong to the Corvi. They speak with a human voice and articulation, and beat all the talking birds that I ever heard. The affected woman's giggle of one made me laugh till my sides ached. Thence we walked to the house of Peithman, once gardener to the Governor-General, now employed by Government to wander about the Dutch Indies and gather curios. His wife, a charming old Teniers Dutch lady, keeps many gauze cages full of mantis. There are the famous stick, flower, and leafinsects. They are dry and green, fresh, withered, and spotted, and like the flower of the plant on which they live; with my nose alongside of them, I could not make certain which was plant, which creature. The old dame pulled them off, and pulled out great wings lil- those of a locust highly coloured, and then pointed out that the snout was coloured like a freshly-broken stick. She let the creature down, and it

became a stick, as still as a broken twig, with horns and legs arranged to imitate the branch of the plant. Then it got up and walked on six legs with a ludicrous gait, and she herded the stick back to its place in the cage. Some she cast back on the plant, and each became a twig once more. The twigs and leaves feed on plant leaves. The flower eats When they come to feed on the flower, it butterflies. springs on them and eats them up in a moment. There were hundreds of them, and thousands of eggs, which they offered to give me to send home in a letter. They hatch well in hot-houses, but their food is hard to get. It is the leaves of the plant which bears a hairy-red fruit like a chestnut. The inside is a clear blob with a stone in it. Very good, but very rare in England. Next we came to a longnosed monkey of most ludicrous countenance, his back is so striped, that he seems to wear a coat and trousers. A dead one stuffed was as big as a small boy. Then we came to the black cockatoo; his bill is long and hooked, but his tongue and throat are wonderful. They gave him a fruit with worms in the skin, he cut that with his bill, then he poked in his tongue, which is split at the end, picked out a worm with the pincers, turned back the tongue like a small elephant's trunk, and then he chewed the worm with his throat, and swallowed it with his inside, gaping all the while. The tongue picked the fruit to bits, and the throat masticated till the meal was done. Then we got to the Celebes antelope, which is like a small dark-brown or blackish eland. Then to whole herds of guinea pigs and rat-deer, which are little bigger. Then to cassowaries and tiger cats, and apes, and peacocks, such as the Queen of

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Sheba might have given to Solomon. Then to shells and corals, and marvels of the sea, to hats and coats, and mats and dresses of these warm isles of the blest and spice gales, among which Peithman wanders yearly. Then we got to a musical box, and sat in a group, like a picture by Mieris, listening to the music. Then we went to the botanical museum, and I wished for your knowledge or more to replace my own ignorance. Thence we went to the garden, and there I knew what I wanted, and got it from the head swell. There are certain seeds which drift about the world. I wanted to see them at home growing, and here in Java they are in abundance. The Entada scandens is the big nut which comes to Scotland, it is common here and in Ceylon. One plant in this garden is as thick as a man's body at the roots and climbs more than a hundred yards over the tallest trees. swinging like a ship's cable, from tree to tree. The leaf is small, so is the flower, and the pod is about three feet long. I have specimens of the fruit and of the Mucuna, which are the brown beans with black bands round them, which are called horse-eyes. Now look to a chart of ocean currents, and you will see that two part from these islands, one to flow round the Pacific, the other round the Cape of Good Hope, and up the Atlantic to Novaia Zemlia, where samples of Entada scandens gave the name of Castanie, to one lately discovered island in the ice of the Polar Basin. The double cocoa-nut of the Seychelles is another drift seed; here they grow the plant, and yesterday I saw it. In the old days it was believed that the seed grew at the bottom of the sea. A Sultan gave one as a great gift to the Dutch. The palm has a great fan-leaf, and flourishes in the botanical gardens. Then

we got to the India-rubber ficus; it drops stems from the branches, and the roots crawl all over the ground, bare, thin claws of things like an eagle's foot, fifty feet long, I suppose. Then we got to groups of tree ferns with orchids on their stems, and to clumps of palms from all parts, and to green, flat-stemmed creepers, at whose roots grow fungi, which look like tarts, and smell so like decayed meat that flies blow them in error.

The head man talked Dutch, and I English, French, and other lingos, and with the help of Fraser we had a good time.

No. XLIV.

SANDANLAYA,

Monday, 15th.

MY DEAR K.,

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Here we are up in the hills, and in the monsoon. Were it not for the queer trees I could fancy myself in a warm autumn flood in the West Highlands. The glass is 64°, and the water 64°, and the wind N.W. A great volcano is in front of me and I can see it as well as you see Bein Uaish when it rains hard. A waterfall has been pouring off the roof all night, and the sound of many waters is in my ears. This is not my notion of the tropics.

Yesterday we drove up in a grand carriage, which we have bought, dragged gratis by Government horses and buffaloes, under an order of Governor-General Loudon, which is to frank us through Java, as far as we choose to go. If it goes on pouring like this, I shall take to the steamers, and get to some drier place. Our drive yesterday was very interesting, and would have driven you a gardener wild. Ferns with fronds

ten feet long, and stems twenty to thirty, fill the burns, and overhang their falls, and clothe the hill-sides. Many look like familiar Scotch ferns magnified. Palms, bananas, ricefields, coffee, sugar, tea, apples, pears, cherries, tobacco, every sort of thing tropical and temperate grows on these hills among the virgin forest. Everything is wet and green, and luxuriant to an extent that I never imagined. The people wear coloured draperies for ornament and propriety, but children and coolies wear next to nothing, or their own brown birthday suits. They wear hats as wide as a moderate 'brella, and carry burdens on poles. Fish of strong odour were going up, packets of garden produce were going down, and that produce will presently go to Europe. We took seven hours to get here, and landed in the dark at a sanitarium. Dr. Bloom is the hotel keeper and medical man of the place. Close to it is another Governor's garden, and sick soldiers abound. Stag's horns are in the veranda, a red waterfall pours into a swimming-bath, and there I swam at half-past six. My comrades snored meantime, and they have just arrived at ten.

Now I must go see something.

FAILTE.

No. XLV.

SUMADUORG, SOEMEDANG, JAVA, Friday, March 19th, 1875.

MY DEAR MOTHER,

Men should never marry; at least they never ought to travel with other men, so I presume that they never ought to travel through life with a partner. Here we are like the royal family, "three in a gig," or three men in a carriage

drawn by Government cattle, rushing about Java as if the deel were after us. "Black care sits behind the horseman," and he sits behind our carriage. I have had to learn Malay for the last week, and I can buy and sell and do something in that tongue now. Pookul Vrapa—What's o'clock? Makannan Ada—Have you grub? Roti—bread, and so on. By my old plan of grinning and saying Baika-good, I get on here. People do not get on here pleasantly by scowling and shouting "-- you, you idiot! Can't you understand? Bring me the mustard, you cursed nigger—you fool." I sincerely wish that I were jogging along in single blessedness, once more a solitary traveller, picking up knowledge, and enjoying this beautiful world quietly. It is a beautiful world here. The climate seems to be steady at 73° in the houses, or at 65° higher up, or at 85° lower down near the sea. It seems to rain every day, but now that the monsoon begins to end, it does not rain much every day, and the hills are generally clear at some hour or other. When they are not quite clear, the foreground is like a steaming, misty, tropical hot-house, all over the wide landscape. Cocoa-nut, palms, bananas, and treeferns are the most striking vegetables; but a gardener would be driven wild by the luxuriance of the greenery, and the variety of the plants. I study the shapes of hills, which seem all to be volcanoes active, or burnt out. I did not go up to the top of one near Bandong. The craters are forest-clad at top, but sulphur smoked below, and there steam and hot springs sputter among crusts of sulphur and cinders. At night a lot of flying-foxes came flapping over the hotel. They looked like great buzzards or owls. A. shot at one, but we did not get him. In the morning, a humming-bird came to a flower

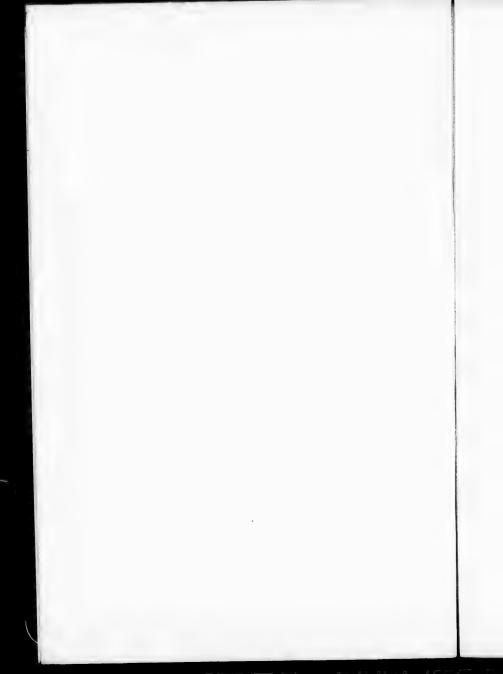
at our veranda, and there fed to my great entertainment. At noon to-day a butterfly as big as the bird came and hung over a flower, and stuck his long proboscis in and drank his dram o' ey, and flitted off to another flower, and had another ..., and finally be whisked round a bush, and fled to other pastures. He was a grand fly, with long tails to his wings, glittering in the sun like that diamond ornament which is to adorn my spouse when I get one. By the way, I think it would look well in black hair on a brown skin. The ladies of this country seem to wear as few clothes as they possibly can. A "Sarong" wrapped round their waists, hanging in thin cotton folds to their ankles, and a baby-sling over their bare shoulders, make the day dress of women and girls. Children wear nothing but a neeklace and a pair of bangles; men next to nothing, and a big hat. They remind me of that Irish family who had one suit. When I go wandering up and down in a market, as I did yesterday, or whirl through one, as I did to-day, I seem to be in a gallery of Greek bronzes come to life, and posed for an artist. But when I try to draw, my sitters put on their clothes, and modestly turn the backs of their heads my way, so that I am forced to give it up as hopeless or shoot flying. At four we are to go to the Post Kontor, and order horses for 2 A.M. to-morrow. The sun rises at six, and we came to see the country. We are in the most beautiful part of Java as I am told, and that is how I am to see it, and the people who dwell in it, all because I was weak enough to join myself to other travellers; and so, as I said before, men ought never to marry, but live and die old bachelors, as I mean to do. That diamond butterfly will have to wait for next generation.

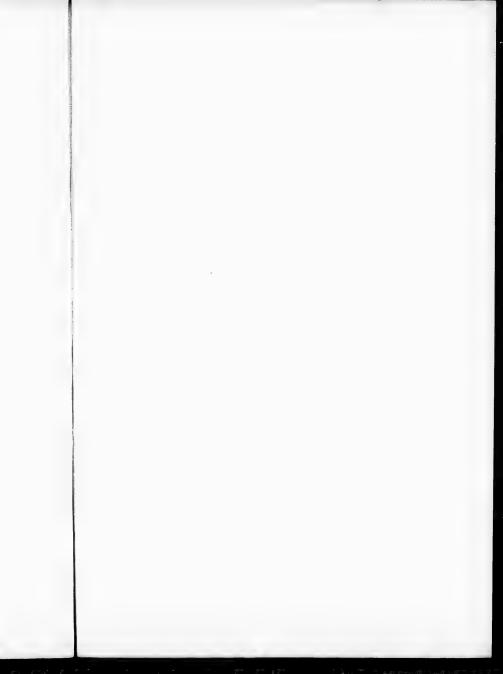
WOMEN POUNDING RICE BANDONG, JAVA.

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ROADSIDE PEOPLE.

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ROADSIDE PEOPLE

Cheribon, Sunday.—We started at two, and saw the hills by torchlight, which was a new and curious experience. A great bundle of split bamboo was stuck up behind, and made a circle of light about our glorious carriage. In and out of that luminous sphere rushed "Looopers," brown, active, halfclad muscular Malays, shouting and cracking whips, while the coachman fired salutes of cracks about the ears of our cattle. Then the drag went on, and we went down derry down hills in fear of breakages. At dawn we broke the drag. and got down to the jungle which fringes the foot-hills. Monkeys were swinging and chattering in the tree-tops, and flies were buzzing as bluebe++les buzz in a hot English noon. As the sun rose we got into the tropical jungle. The forest was made of tall, broad-leaved trees, growing in wet, steaming. brown mud, and the whole plain was cut up with narrow water-courses. It looked like fever personified, and now and then it smelt horribly of fungi. It is full of tigers, but we saw none. In half an hour we got through this belt into an open plain, rich with rice and sugar-cane, and fresh after the forest. But the glass was about 80° at sunrise, and the steam in the air made the heat oppressive. Presently we got to a station, and some dozens of brown men and boys dragged us to a rich, muddy, broad, shallow river, which we forded. Coolies by the dozen were wading over with their burdens. and a pretty brown girl sat in the stream bathing placidly while we crossed. Then we got to a bigger river, over which we boated on bamboo stages and a double Castalia boat. Men pushed, and pulled, and waded, and poled, and so we got over, and then we stuck for lack of horses. The German postmaster gave us food and benches

under a shed, and then we went off in the heat to a sugarmill. There the owner showed us the works under repair, and after feeding us on water and cigars, sent us back to the post in his carriage. There we lay under the shed, and rested till the horses had their rest, and then off we set to get in here at 8 P.M. in the dark.

I have been to the Post Kontor, and find that I must go in three days along the coast through rain and floods, and that I may be stopped for ten hours at some river or other. If so be I cannot help it, I have telegraphed for horses all down the road, and at six to-morrow I start (D.V.). So now picture to yourself a large barouche, with a white awning over all, dickey and coach-box. A coachman in Malay costume, driving four or six horses, as the case may be, from the box, and two or three "Loopers," wild Malays, rushing alongside, leaping up behind on steps made for them, cracking whips, yelling, leaping up in the air, and behaving like maniac running footmen. Four tiny ponies at full gallop, stopping suddenly at the least rise, or rut, or roughness in the road. Then men pushing, pulling, turning wheels, flogging, and calling for aid. Small boys, old men and young, tumbling out of bamboo brakes and plantain-gardens, and helping as they can. In the midst, my venerable form, smoking with dignity and perspiring freely. All around, heat-haze; overhead, grey clouds. A steaming heat of 80° to 90°, and a still, hot, leaden sea, with a muddy shore and muddy water; landing-piers built of coral; Malay boats and Chinese junks, and steamers out in the roads. If you can manage to imagine all this, you will have some idea of travelling in Java with Government post-horses all free, gratis, and for nothing. I don't feel as if it were going to cost me a fever, but it certainly is uncommonly hot work. As targets are set up in the Government regulations, I do it all "with the greatest care." I carry an umbrella, and I drink no stronger drinks than beer.

Now for this house. The master has a Jewish nose, and the mistress also, and black hair. Her daughters are like her. They go about barefooted in white sleeping-dresses, with hair down all morning, and after breakfast of bread and cheese, the house has become a pandemonium of noisy infants.

Good-bye till next letter.

J. F. C.

No. XLVI.

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PEKALONGAN, JAVA, March 24th, 1875.

My DEAR MOTHER,

Poor old F. used to sing a joyous song with this chorus—  $\,$ 

"My wife's dead, and I'm a widower,
I'm a widower, I'm a widower.
I'm very glad that I've got rid of her,
Oh! yes I am."

Here I am, all alone in the midst of a great carriage, in the middle of a great island, in the middle of the great sea, surrounded by volcanoes, and in tropical heat, enjoying fire after Japanese frost. I started on Monday right early, after a fearful night of "Donner and Blitzen" and a deluge of hot rain. I got off at daylight, and made good progress under a fine blue sky in a fresh breeze, admiring the great volcanic

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mountain which stands opposite to Cheribon. The name of it is Tjerimai, and it is 10,754 feet high, according to the map. The cone is nearly finished; the crater at top must be quite a narrow basin. As we got on we got to worse roads, then to wet roads, then to water, and then to Losari and a big river, where my coachman said, "Brenta," wait: "Malayman no sabe." I went and looked over a bamboo hurdle, and there was a red flood pouring past, and the royal mail waiting till it ran out. "Rusticus [eggs peeked at] dum defluat amnis." I ate cold rice and hard eggs, and drank cold water and tea, and reposed for about six hours. Ther my carriage was hauled on to a Castalia boat, with bamboo hurdles on it. Men, women, and coolies crowded in, and over I went. Then I had to wait for horses or harness or something, so I sketched natives. Then we got off once more, and drove helter-skelter through floods two or three feet deep in the road. Men were wading breast high in sidepaths; the water was deep in the houses. All the population were fishing in their fields of rice. The only truly contented creatures were the buffaloes. I thought of old Gaelic tales about water-bulls, and decided that Bos primagenus must have been a buffalo of mild aspect and great power, fond of water and swamps. There were these great brown and white and mouse-coloured kye, tethered in rows on dry mounds, or standing up to their shoulders in the water, or laid down so flat that nothing but a face and a pair of horns, or it may be a bit of hump, appeared in the air. In the midst of all this water rose rice-tops, and now and then a great cane-brake; but that forest of reeds was sugar. Presently we got out of the floods, and by eight I was housed at



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Th the fiel Tagal. A ball was going on next to the Belle Vue Hotel. The music was funereal in time, horrible in tune, lamentable in tone. It continued all night, and chimed in with the music of mosquitoes. It was an unquiet, hot night, and noisy. I looked in at the ball, and saw young men in white coats and polished shoes enjoying themselves after the fashion of their age and native country—solemnly. A Dutchman is even more bored by amusement than I am.

On Tuesday I was off at dawn, and I got housed at 4 P.M. at a good place without difficulty. To my right was Slamat, 12,104 feet high, with a crater at 10,776 feet. mountain, in the same state as Vesuvius—a cone risen in an older crater, but not yet complete, like the next neighbour, Tjerimai. The day was beautiful—79° to 89°, with a bright clear blue sky and a fresh sea-breeze. I sat all over the carriage, front and back; got out all my bags, and hung them on divers pegs in divers ways, to try how I could make myself most comfortable and look most like a governor-general. The result was my own great contentment and the awe and reverence of the whole country. Every man I met took off his broad umbrella hat, and passed me with an awed face. I smiled and nodded, and touched my hat royally, and so we got on fast and cheerily all day. The great fun seemed to be fishing in ditches; the great industry, rice cultivation. A lot of buffaloes and ploughs, with men sitting on the wood, march and wade and splutter about in the mud and water till they make a kind of nasty chocolate of a whole field. Then women wade in with bundles of green plants, and stick them in rows with their hands. Close to them are ripe green fields and yellow grain, and the road was crowded with

coolies carrying rice-sheaves to market. They are a brown people, with a strong tendency towards black now and then. Picture to yourself a naked boy, plastered with grey mad, riding on a muddy buffalo, wading up to his knees in mud; or a dozen buffaloes wallowing on a muddy shore by a muddy stream; or three boys in draperies of primitive colours and natural brown skin riding on one white buffalo, pacing solemnly down the street; or a whole herd of buffaloes all over mud with one boy herding them, seated in state on the biggest, all standing in standing muddy water, picking green pasture out of the slime. Then put in a great green cool thicket of sugar-cane, ten feet high, and men and boys gnawing bits as they go along the road; then put in a strong smell of dampness and heat, and a glare of light that eyes can hardly bear, and there you have a picture of Java as I saw it yesterday. Then come to a river-bank, crowded with earts and coolies, and smelling abominably. The Castalia double canoe stage boat comes in, and the carriage is hauled on board, A pretty girl, modestly covering her bare self with a wet sarong, is up to her neck in brown water. Souse she goes under, and a cloud of black hair floats above her; up she comes, having changed her sarong below, and there she stands, wringing one garment, clad in the other, bathing in mud and water at 85°. Near are men scrubbing themselves, and men scrubbing the hides of grey buffaloes laid in the river. They are twitching their ears, and sending a sparkling shower of light out into the hot air with every snort and twitch. Over we go, and a whole crowd of coolies take the wheels of my state-coach and sing. I could fancy it a Gaelic song. The leader gives out a few words in good

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time and tune, with a grand voice, true as a Japanese gong; then the whole lot sing "Leila," and haul. Up I go an inch. Then come more verses, and at each "Leila" up I go till I get to dry land once more. I pay, and off I go to stick in the mud. Down leap the "Loopers;" the coachman yells; the "Loopers" thrash; the horses kick, and do everything but pull. The "Loopers" push the wheels. They summon passing coolies; they push, and pull, and shout, and at last off we go again at full gallop, shouting, "Hoo! Hio! Hoo! Yah! Hurray! Hoo!" Stamp, crack, crack, erack; and so we travel in Java with a Government order for free post-horses and a grand Batavia carriage, which is the greatest imposition of the whole. Here I was told that I must wait five days for horses. I wrote to the Resident, and I am to start at noon for Samarang. This letter is the result of my morning's delay at Pekalongan.

Samarang, 25th.—At one I started, took off my coat, tucked up my shirt-sleeves and trousers, and spread myself out in the cool breeze, which, travelling on good roads at a good pace, blew in my face. After a while we began a rise, and rose 900 feet over a spur of the hills. We got into a dark, damp forest of broad-leaved teak-trees, adorned with ferns and orchids, and hung with creepers. Strange birds whistled and sang. Six buffaloes were harnessed ahead of six ponies, and on we went. Down came rain, and everything steamed. Then, at dusk, we came to a deep pool in a red river, amongst stones of whinstone under green irees. In the water swam a whole herd of buffaloes, looking like my idea of hippopotami. Naked brown boys ran about yelling and pelting their cattle, and herding the amphibious brutes. It

was a strange, weird picture, unlike anything that ever I saw or heard about. Presently a couple of the brutes were fished out and harnessed, and they solemnly paced up a hill, dragging horses and carriage, while a small boy did all the driving. No wonder "Tarbh uisge" is the friend of man in Gaelic tales. Then night fell, and I fell to feeding in the dark. I made such a mess of it, that I took a swig out of a bottle and stopped.

Thenceforth, till the moon rose, I saw Java by torchlight. After the moon rose, I went to sleep barcheaded, and saw it in my dreams. Every six miles I had to wake up and pay "Loopers" and coachmen, and try to talk Malay. Then I found that I was in a new language, the third which I have passed in Java. Malay was useless, and I was dumb; so I paid, and slept till the dawn came as suddenly as the day went, and then I arrived at the Pavilion Hotel in Samarang. I have delivered my letters; I have seen E——, and on the advice which I got to-night I shall act—either go on wandering, or go off by steamer to Singapore to-morrow.

I have made up my mind to leave Java to-morrow in the steamer for Singapore, and get to Ceylon by the first mail.

Good-bye till next letter.

J. F. C.

In consequence of the break-down of the carriage I did not go to the greatest sights of Java, to wit, the great Hindu ruins near Samarang, and to the scene of a recent eruption of mud from a cone further east. By the kindness of many friends I might have travelled with ease and comfort, on shore and at sea, far and near, in these magnificent islands.

Rain, heat, overworked cattle, and a broken carriage on shore; a very pleasant party on board a well found ship, and downright sloth made me leave Java. The carriage was afterwards sold and the money divided with the owners in London. Few people seemed to know the story of the ruins. An old friend, Mr. John Crawford, in 1862, gave me a number of Javanese bronzes with this note:—

"This cup-presented by the undersigned to his friend,

John F. Campbell, Esquire,

—was brought from Java in 1817. It is a Hindu sacrificial cup found among the ruins of Hindu temples, and bears the date in figures 1241 of the era of Salna, or Salivana, a prevalent one in Southern India, from whence it was that the ancient Javanese acquired their Hinduism. The era of Salna corresponds with A.D. 79, which, by the way, was that in which Pompeii and Herculaneum were destroyed. The cup was therefore manufactured in the year of Christ, 1320, and is at date of this memorandum 542 years old.

(Signed) "J. Crawford,
"15, William Street,
"January 19, 1862."

The cup is  $4\frac{1}{2}$  inches high, and has the signs of the Zodiac and other figures upon it in low relief.

2. "Bronze figure of 'Dave,' consort of Vishnu, the third person of the Hindu Triad. From Hindu ruins in Java."

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- 3. A figure of Buddha, with an inscription on the back of the screen under which he is seated.
- 4. Buddha standing, draped, with a glory behind his head, one hand in the attitude of blessing, the other holding a lotus.
  - 5. A bell, said to be of great historic interest.
  - 6. Smaller figure, seated, apparently the same as 2.
  - 7. Buddha, seated.
  - 8. Figure, seated.
- 9. A couchant monster, intended to pour oil or some fluid from his mouth. He is most like a conventional dog.

These bronzes may indicate the origin of Javanese ruins, of which I have heard a great deal and saw very little. A gentleman at Samarang told me that a great many golden utensils had lately been found on his property, which is near these famous ruins.

The natives looked cowed, but they are proud and ready to avenge insult. A lady had a good servant, and entertained a guest, who spoke to him rudely. The servant came to his mistress and resigned.

- "Why?" said the lady.
- "If I stay I must kill that gentleman!" said the servant.
- " Nonsense," said the lady.

But next day came the same story, more earnestly told than ever. So the lady, to save her guest, let her good servant go; and he went and so escaped murder.

Nevertheless, I would readily engage that Malay man, crease and all; for a kind word has equal power with a cross curse in Java. That I saw for myself. The ancients were highly civilized, and the moderns have high spirit. Politics

ancient or modern are out of my line, but stories come within my bounds. It is told that an English minister gave away Java, having no notion what the place was like, how big it was, or what it was worth. It is told that the Dutch, having got Java, wished to make roads. A governor ordered the natives to make a road, and threatened to hang the chief if it was not made, and well made, within a given time. Something went wrong, and the chief and a dozen of his people were hanged by the road side. No wonder the Java roads are good, and no wonder the natives looked at me as if I were going to order them to execution from my state coach. I own that I breathed long gasps when I got to the free shade of the Union Jack, away from cringing bullied mortals in damp heat.

No. XLVII. FRENCH MAIL "HOOGHLY," AT SEA, INDIAN OCEAN,

Monday, April 5th, 1875.

MY DEAR MOTHER,

On board of this ship ought to be several letters of mine up to Samarang and Good Friday, March 26th.

On that day I found that the famous Batavian carriage was so injured, that I could not venture to travel in it, even with gratis horses. So I got on board of a ship, and left the country and the carriage. A lot of people are on board, all dressed in quaint tropical costumes. To be in the fashion, I put on a Chinese blue silk coat, and so we enjoyed ourselves, till we got to Singapore on Easter Monday at dusk. Now you may remember your Easter weather, and compare it with mine. The sea-water was 85° to 83°, the air in the coolest

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place about 80°. All day long the sky was covered with clouds, which rose up in tall pillars till they got to cool regions, from 12,000 to 20,000 feet up in the blue sky. There they condensed, and down came a plumper of tropical rain. I could see it beginning to fall, falling and hiding lower and more distant clouds. When we got under one of these pillars of cloud the rain roared as it fell on deck, and ran off in torrents into the sea. At night streaks of blue lightning fell, and ran along the horizon from cloud to cloud, and thunder growled. The air was still, and the shallow hot sea calm. While far from land, 150 miles at least, bright tropical birds of the land passed us, and went on their way. When we got near Bangka and Sumatra, the sea was covered with floating flowers, leaves, fruits, and whole trees. When we got near the mouth of a big river the sea was brown with thick Sumatra mud. A strong tide was running west into the Indian Ocean carrying all this drift to be the sport of winds and waves, and to reach Scotland in the Gulf Stream. Arrived at Singapore, I went to a coral beach one fine morning, and spent some hours in seeking for some miles for my pet fairy eggs. I found none, but I found a great lot of fruits and débris, which I shall look for when I get home. I found all manner of treasures of the deep congregated and collected and cast ashore in the narrow neck through which the waters of the Pacific and Indian oceans mingle. The coral sand was strewn with beautiful little shells, and with sponges and plates of crabs and sea-urchins. I filled my pockets and stung my fingers.

Meantime a stream of coolies and natives, Chinese and Malays, trotted along the beach, each with a bare hide and a

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big hat, and a long pole, and a double burden of fish and fruits. and produce, of sea and land. Then came a solemn Indian in a turban, then a black Indian in a white plaid draped about his ebony limbs, then a Malay woman came out of a grove of cocoa-nut palms whose gnarled roots grow in the sea-sand. In another minute she is up to her brown neck in the blue sea washing sarongs of all known and unknown colours of Malay manufacture. Then came a tall well-made Malay papa with a stark naked Malay child. They stopped at a hole in the sand, and the big one began to dig with his brawny hands; no terrier after rat ever dug better. I joined the party and watched. When the hands were at the limit of the arms and the head of the digger was on the hard sand, I said, "Trada," he is not there. "Ada" said the Malay, he is there. But he is there still as far as I know. He is a burrowing edible crab. I saw lots of his work, a fresh pile of wet sand thrown out of a rat hole, with the marks of sharp claws all over the mound. Him I did not see, but I saw his shell. By nine it was so desperately hot that I got into my Malay boat and was rowed back by a Chinaman to Singapore. Another day I went to the races. All races are a bore, and these were no exception, but the spectators were my delight. I got into the ruck among a lot of Chinese and Malays. A little boy beside me had a great gold chain round his neck, bracelets and other braws on his yellow skin--his head was half shaven, and the back of it was the foundation for a long black tail. Fat fubsy Chinese parents, devoid of beards, chattered and betted, and wore felt hats to be European-like. Presently came a bustle, and the Governor's carriages came swinging up to the grand stand. Brown coachmen in red and gold Malay fancy dresses looked gorgeous. Out stepped my late fellow-passengers, now Governor's guests. Presently they were conversing with the Tumangong. I cowered among the Chinamen, and was not seen, I hope, for my dress was too shabby for such dignitaries. I was asked to dine, but my letter was brought to me at ten, so I could not go. Next morning that party went off to China with F. That evening A. arrived from Batavia. On the 1st of April I went on board the *Hoogly* French mail.

I saw Mount Ophir on the Malay Peninsula one day. I saw the high mountains about Acheen yesterday. We slipped through a narrow passage about two, and got out of the still Straits into the heaving Indian Ocean. At six I went forward to "the eyes of her;" and there watched the sun go down into the sea right ahead, due west. It took two minutes and five seconds to finish that plunge.

In 1873, in the White Sea, I timed the same proceeding; and saw the sun nearly north slide into the Arctic basia, and take twelve minutes to hide his hot self under the cold blue sea. Here night fell like a curtain; there dusk and dawn made all the night that we saw near Archangel.

At this moment a very polite officer tells me that I cannot sit in the cabin without my coat, so I must put it on. I had some thoughts of fetching out my Archangel coat to rebuke the absurdity, but being polite I bowed and grinned, and clothed myself; and here I am, with stewards only to look at me, sweltering because of civilization. Drat civilization! The best of it is, that the whole ship is overrun with children nearly naked; and all morning men and women, half-clad, pervade the deck, and parade on their way to and

from baths. Furthermore, our ancestors the apes abound all over the ship, some with, some without, tails. None are elothed, and nobody cares. One has found to his cost that even a tail may be a cause of suffering. Two green parrots have been put into the same cage, and they bite the monkey's tail, unless he tucks it carefully up out of their reach. As it is with that tail, so it is with my coat. It is a bore, but I must wear it. Drat fashion! Besides apes and peacocks, and gold of Ophir, we have diamonds from Borneo, birds from Japan, eigars from Manilla, and wares from China. Among other curiosities are two Chinese nurses, and a Malay servant, and a lot of Eurasian children of unknown breeds. We have Spaniards, Italians, French, German, Dutch, Britons; and languages more than grew at Babel go babbling all round the ship day and night. But the chief aim and object of everybody is to get into a windy place, sit still and sleep. Whole armies of convulsed chairs sprawl all over the deck, and in them straddle their owners, with their names written over their heads. I have no chair, so I look out for the best placed and sit there till the owner comes. Then I start up, and beg his pardon in his own language if I can; and so I have made friends with no end of injured chairmen. One has given me a daily Manilla ever since I thus made his acquaintance. We jabber Spanish at meal-times. He is the picture of Louis Napoleon, Emperor of the French. His hand was nearly cut off in a fight with Manillan natives, and I cut his food in return for his cigars. And now this jabber must cease. I hope to land on Wednesday 7th at Galle; get letters, and then make plans. I shall stay about three weeks in Ceylon, and then possibly come back.

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illfnd Alexandria will be a good place to write to. I see the *Times* everywhere.

J. F. C.

No. XLVIII.

Colombo, Friday, April 9th, 1875.

MY DEAR --

Here I am, sitting at 7 A.M. by the sounding sea, with a coral strand beside me alive with land-crabs, and the glass at 81°. Fleets of flying prows are gliding out towards the horizon to catch flying-fish, and all manner of quaint crows are making music, with the waves for accompaniment. It is Laggan strand in the tropics, seen through groves of cocoa-nut palms, over an undergrowth of cacti, which grow in the coral sand. I have very few clothes on, and wish that the bonds of civilization were loosed, and that I was in native costume. That is, a brown and black birthday suit, with cotton draperies, and a palm-leaf umbrella, and a basket cap or a turban.

Yesterday, at 6 A.M., I started with A—— in the mail-coach from Galle, and drove about seventy miles along the shore through a continuous forest of cocoa-nuts, grand coral and red sandstone and on greenstone rock. We went at a famous pace in true English fashion, and fear the difference of horses. In Java we were dragged by four or six rats or pied mice of ponies, which stopped at every rise. Black Malay "Loopers" hung on behind, and whooped "Hoo!" and cracked whips, and thrashed their miserable cattle all day long. Here a dark Sinhalese, in a red turban, blew a horn, and two bony, English-bred horses

trotted and cantered merrily, and never needed whip or spur. The Javanese looked awestruck and bullied. look like mild-eyed, marmoset monkeys—happy and content. The naked children ran after the mail and cheered; even the native curs cocked their tails impudently, and barked with British independence. I got down to look at a heap of stones; picked up nothing but the most beautiful specimens of rolled coral; and, when I had got about a stone weight, I pelted the dogs with the precious freight. It was warm, but the air is light and dry. Instead of stewing in Java and boiling at Singapore, here in Ceylon we fry, or grill and dry. We were turning to living mushroom-beds, with green mildew and blue mould; here we feel fresh and clean, and enjoy life. As usual, my chief joys are the people. I never tire of looking at the living gallery of tableaux vivants. The men wear long black glossy hair, tied in a knot at the back, and fastened in front with a big tortoiseshell comb. They have black beards, and some have great shaggy masses of wavy hair flowing wildly over their shoulders. The boys and children are often beautiful, and the whole lot are beautifully formed, like bronze Apollinos and black Apollos and Venuses of all the best-known kinds, large and small. Picture to yourself a pair of hump-backed, mouse-coloured bullocks dragging a covered cart full of Sinhalese, all grinning and glittering with ivory teeth and silver bangles and bits of cotton colour, and sparkles of sunlight on their polished shoulders and foreheads. Then place a solemn, draped, bearded black man with European features between the cattle and the cart, stalking along the white or red road with the dignity of an emperor, and carrying a cane for sceptre. For back-ground a maze of

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queer, long, jointed, bent stems, with great bulbs for roots, and green plumes of palm-leaves for crowns. Through the forest a bright-blue rolling sea of clear water glittering, and a dazzling, shining white sand, with a grand surf, rushes alongside, and a fresh breeze blows the curtains of the mail-coach aside to exhibit two smoking Englishmen, without coats, rejoicing. Hooray! out rush a lot of black bairns, stark naked, and a lot of brown dogs, barking. Too-too-too goes the horn; away go the bullocks into the ditch. Black eyes flash, and white teeth grin, and so we go on to tiffin. We walk to a rest-house on a rising ground, eat chickens, curry and rice, bananas, beer, coffee, cocoa-nuts, and bread, wash, loll in arm-chairs, smoke, and wish that we could stay there and eat pearl oysters and be Robinson Crusoes. Then too-too-too goes the horn, and off we go to Colombo. By the way, the people on the Hoogly named me Sinbad the Sailor. The people at Shanghai named me St. Paul, so there must be something about me which I do not realize. A Chinaman at Canton stroked my beard and asked if I was seventy. Some washed-out tropical Dutchmen laid a bet, and asked me to settle it by saying whether I was twenty-five or thirty-I told thom fifty-three. I suppose that I am the five. wandering Jev. I added: "Sir, I do not drink brandy, and that is why my hair is on my head and my beard devoid of snow, and my aged self able to enjoy life." The rebuked Dutchman took another B. and S., and I joined for goodfellowship.

My last Times date is February 1st, which I got at Singapore. I expect to get March 1st here. Besides all these, I have got a lot of letter. from George Campbell, and a lot of

invitations from a lot of his friends. Further, three other Campbells had my letters, and opened some, and they have offered me houses and horses and hospitality. I mean to go up to Candy, and on to the Sanitarium and George Campbell to-morrow. After that I shall settle what next to do in Ceylon.

Now I must go breakfast, for this is my last sheet of paper.

Ta, ta.

J. F. C.

P.S.—I had just done when a grinning black boy and a basket appeared on the scene. Out of it he pulled a live cobra, and proceeded to play pranks with it on the red tiles close to my bare feet. "Take away that snake, you black devil," quo' I, "or I will shy my yellow slipper at you." The boy grinned and the snake went into the basket, and presently put out his hooded head and began to play pranks again. Fancy the feelings of a greenhorn at having that deadly brute flourished at his bave feet while trying to write to his sister from Ceylon. There goes the breakfast-bell, and off I go to eat, being ravenous.

No. XLIX.

NEWERA ELLIA, Tuesday, April 13th, 1875.

MY DEAR MOTHER.

I have ascended to the top of Ceylon and the earthly paradise. Here I am, 6,600 feet above the sea, in bright sunshine, with the class about 60°. Yesterday morning it was 52° in the glittering dew. On Sunday I dined with Vol. II.

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Governor Gregory on turtle and strawberries, and he lent me a horse. So at dawn on Monday G. W. R. C. A. and I started up Pedro Tullagalla, and went to the highest point in Ceylon, 8,000 feet above the sea. I rode, being old and wise, and they walked. We went through a jungle of unknown trees, up a water-course on a mountain path, followed by a couple of bronze statues in red turbans and white tunics. Birds sang to us, jungle cocks crowed all about us, mists lay below us in flat, even sheets, and gradually boiled up into clouds, which rose and capped the hills. We did not see the distance and to tell truth I did not care. My eyes were earthwards, looking for ice marks, and I found none. I found a beautiful hard, heavy gneiss, which my geological hammer showed to be full of jewels. Garnets I got, and I verily believe that I have got a small ruby. At the foot of this peak is a glen, called "the moon plains." There in the washings of the river people used to gather gems. Here also picnic parties used to hire coolies and pay for their hire with sapphires and such like gear. But the strange things of human nature come out here, and so people who dwell in Paradise pay no heed to the precious things on which they tread. I am too lazy to dig for sapphires and rubies, and so are the rest of the Britons and Tamils here located. Everybody is devoted to coffee and chincona and money-making, and they grow and gather and make to good purpose. Having smashed stones and smoked enough, we toddled quietly down from the top of Pedro, listening to the birds and tree-frogs, and looking at strange butterflies and bloodsuckers. The frogs keep up a constant clacking noise, like the notes of a wooden dulcimer. They have reminded me of a man whom I went to hear when a child.

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He was a Swiss, or a German, or a Tyrolese mountaineer, in a fancy dress, and he used to take out a small pomatum pot and grease his chin. These preliminaries adjusted, he smote his chin with his knuckles and produced strange musical notes, which are ringing in my memory while the tree-frogs and a blacksmith are making my ears ring with the same The butterflies are beautiful; they look like animated rubies, sapphires, and emeralds, flown out of the gneiss of Pedro Tullagalla. The bloodsuckers are harmless lizards, with spines on their backs, and quaint, large, brilliant eyes; their favourite colour is emerald green, but when they get on dark leaves they put on olive, and when they get upon the bark of a moss-grown tree, they dress for the occasion, and change their brilliant garments for sober browns and whites. When they are disturbed in their minds and in fear, they put on mourning and turn black and white. As we came down the brown red path, we disturbed an emerald with a long tail, who had just scratched a hole in the sand to lay six white eggs therein. The lady walked off slowly and went up a tree and turned colour. Then she looked round the corner at us and put on mourning, for we dug up the eggs and carried off the family before her very eyes. The eggs were given to the family of G. W. R., a lot of bright little girls, who dressed themselves in smiles and buried the other family to be hatched in the sand and sun of their garden. What the emerald did, I know not. I touched her disconsolate discoloured tail with my stick, and she went round the tree and out of my sight, lamenting. Then we got down to the proposed site of a new house. It is in a grove of Aaron's rods, long, brown, withered things with broad leaves, like the

long yellow spikes which grow in our garden, but twice as big. A tiny clear rill of cool pure mountain water purls through green turf, over pebbles which may be jewels, and a great tree grows alone in this natural clearing. It is a strange weird thrawn tree, like a vast grey heather rope, turning sunwise, and screwing itself up towards the sky for some sixty feet. Then it spreads out far and wide a green umbrella to keep off the vertical sun from the site of the house that G. W. R. is building in his brains. In the evening we three and Mrs. C. and two bronze statues and two white horses drove down to Hackgalla, past an artificial lake and "Baker's Farm." The lake is a new feature of beauty, invented by G. W. R. and executed by the Governor. They simply built a wall at a narrow place, and the river filled up a great bit of the plain, and drowned the happy hunting grounds of the "Genmers." Baker's Farm was instituted by Sir Samuel, and many of his imported Englishmen are still here. Some have become rich planters; others are dirty old drunken amiable reprobates. With one I fraternized; I boasted of the shot which I carry in my legs, and he told me the tale of the mishap that here took place out elk shooting at Baker's Faint. It was much the same as the story which I have heard, and the catastrophe was the same. Hackgalla we got down to on a beautiful road in a steep ravine. It is a botanical garden for experimental ends, managed by a certain Mr. Thwaites, who is a collector of birds and butterflies. He showed us drawers and cases without end. Among his contrivances he showed birds preserved entire by pouring carbolic acid down their dead throats. There they are, feathered mummies of great price, but shrunk and shrivelled, and dead and disagreeable.

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They are not at all like the stuffed birds of Gould and other artists in taxidermy, who make feathered skins seem to live Then we went into the garden, which is simply a bit of half-cleared jungle, with stony paths and briars in it. It is a quaint place and a beautiful, and one that would have charmed K., to whom please to send this. We were shown many kinds of tea, and young plantations of chincona, and older trees partially skinned to make quinine. Then it came into my head that the Doctor could not have a better stick, so with the consent of Thwaites and his aid, G. W. R. and I and the curator tackled a small tree, and with a one, two, three, heave, we hauled it out by the roots, and, like children at "French and English," down we staggered with our prize and nearly fell in a heap among the sharp stones. Next we ducked and scrambled into the flower garden, where the amiable Adam of this Eden borrowed my knife and cut a sheaf of roses as big as small cabbages, and lilies, and all manner of things that are beautiful and smell sweet. But even this Paradise has evil in it. "Listen," quoth Thwaites; and we listened to a distant long melancholy howl. "That's the dog," said he. "What dog?" said I. "My dog," quo' he; "I have had him in a trap for ten days." Now in Bulwer's novel of The Coming Race, the man who has got into the earth's interior is mesmerized by a boy, and made a live bait for an icthyosaurus or some other extinct monster, who comes out of the water to eat the man and is shot by the boy with "vrill" and a tube. Here in this garden of Eden is a prowling leopard. "I hope that you feed him," said G. W. R. "Oh, yes," quoth Thwaites; "but I don't give him too much; if I did he wouldn't howl; he tears the sticks to bits with his teeth; I

keep him there for a week or so at a time, and then let him out for a while." Fancy being a bait in a solitary jungle under a vast cliff, for a week at a time, with nothing to eat but sticks, probably sticks of bitter barked chincona. No wonder that dog howled.

Over the garden at half-a-mile rises a great tall cliff, over that, once upon a time, fell an elephant. It is a fact, for his bleached head is there still, sticking in a cleft. The footprints of "elks" were among the tea. So Adam, surnamed Thwaites, has plenty to do in naming and taming his animals. He sits on the hides of apes, and his house contains bottled snakes and frogs, more spirited than the carbolic acid bird mummies, and skewered moths. Laden with our spoils, we drove our white horse up and another home in the dark: and then we dined with G. W. R., and walked home to bed. I live in a mud-built hotel, with rotten planks under the carpet, and live rats in the ceiling, under a broad of pigeons. At intervals, while I am awake in bed, the cat gets into the rat's attic, and there ensues a tremendous scurry-They tell me that house-snakes sometimes take the cat's place, and I listen for gliding sounds amidst the patter of feet. Then a tribe of puppies awake and enter my room and run scrambling races on the reed mats, and scratch the Then a distant jungle-cock gives a sleepy crow, and carpet. tells me that dawn is near. Then a domestic descendant of the same kindred gives a different crow, and I think it is time to rise. But tales of scorpions and snakes in slippers and shoes make one pause. Then light comes, and I rise and go to a bath full of clear cold water, and pour jugs of it over my head till it aches. A large congregation of ducks

next door hear the rush of waters, and gobble and quack madly for envy. Then I get a live bronze, who brings Ceylon coffee, and hard butter, and English toast, and I feed with the hunger of exceeding good health. By that time the sun is over the hills, and I go out and wander till breakfast-time, which here is half-past ten, and liberal at that. By noon the sun casts no shadow. I have just been lolling over a bridge, watching a brace of shining bronzes splashing each other in a clear pool. They kept up the fun for five minutes, and then they dived, and their white soles glanced under water, till their black heads came up to breathe. One head was adorned with long straight hair, like a woman's, the other was like a black mop. The owner trundled it, and scattered shining spray, and surrounded his head with a glory of light and a rainbow. On the bank sat a small crowd of gipsy-like creatures, with pots and pans, and sticks and a fire. Red, yellow, brown, and green garments were on the green grass beside them, and their sleeping-places on the grass were their seats by day. A black, beautiful woman, wrapped in white, looked like an ancient marble of a Roman matron; her hair, dressed in the same classical form, rippled about her classical head. She had silver bangles on her wrists and ankles, and arms; silver rings on her fingers, and on her toes; a necklace of silver; many jewels stuck through many parts of her small, well-formed ears, and a jewel stuck through her nostril. Beside her stood a child, dressed in a bit of string, playing a tune with his fists on a tin can. A tall, black, slender man, with a white cloth round his waist, stood in Hogarth's lines of beauty in the midst of all this Truly those who hold that Adam was black had right

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on their side, for here are the dresses of Paradise in this garden of Eden. But white civilization here has ousted the ways of ancient Adam.

I passed a huntsman in the Bazaar. He led a foxhound, a deerhound, and a lurcher by leashes, and on his head was a stable-pail. He took it off, and out came the dark-skinned, wild-eyed, smiling face, and black mop of the old Adamite race turned into a vulgar stable boy. I went to church on Sunday, and heard money-making and extravagance and modern ways roundly abused and likened to the late eclipse of the sun. Truly Ceylon is a queer place to live in, full of virtue and vice. If it be paradise, it is full of leeches and snakes. I went to walk with G. W. R. and passed the police station. In mud-walled cells behind iron gratings I saw a brace of One was a man, the other a pretty girl, criminals. with a jewel in her nose, and tears in her eyes. What the man had done I neither know nor care—the weeping bronze beauty in her classical white wrappers had run away from her employer, a coffee planter, and for so doing a couple of policemen marched her ten miles over the hills, and shut her up without blankets in a cold grated cell. On Monday a magistrate was to settle her. It is a wonder if the winds of Pedro Tullagalla have not settled on her poor lungs. whole land appears to be colonized by Scotchmen, and they are all making coffee and fortunes. I am shortly to go off on a police inspecting tour. I have fallen in love with a lady aged ten. She lives with a black, ebony and silver, fat solemn nurse to take care of her, and with many brown bronzes to wait on her in a tiny mud cottage in a garden with a green gate, with pet dogs and cats, and comfort all about this the und, as a ned. nite on and e ef rtue . 1 ion. e of girl, hat oing way ıple hut dav nds The hev on adv fat wn

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her. The way here is a steep ascent and a difficult path as the way to paradise ought to be. On Saturday we left the coral and palm-trees at Colombo with the glass at 85°, a railway engine whirled us along a damp, dark, red, muddy, marshy, forest-clad swamp, where rice grows in mud, and men and buffaloes wallow in mire. Then we went right up hill till we got to shelves curved in glittering crystalline gneiss. We looked sheer down on the tree tops and the red rivers and green plantains of the nether world till we got to Gampola. We changed carriages once, and then got into a coach and a thunderstorm. Then we got to coffee and roses, and great masses of white Datura flowers, and at last to the end of a glen and waterfalls. One was red, another beside "Oh the poor coffee estates," said a pasit was white. "There they go to the sea." We came to one from which the rains had washed the soil so far that the coffee trees stood on their roots out of the ground. Not being mangroves they had died. At Ramboddo of the many coloured waterfalls I found a carriage, and grooms, and an orderly. I got in and drove in state and in the dark up and upper to the uppermost top of the pass. By the smell we knew that coffee and daturas, and roses and magnolias, were about us, by the ear we knew of tree frogs, and chirping cicadas. Eyes showed fire-flies, and every now and again a great flash of lightning filled the whole misty glen below. Then down came the rain as we went up, and I tucked in my legs and sat cross-legged on my wooden box, dry and content. But all that long tramp I had little to eat but a green cocoanut that I bought from a black-eyed marmoset who had climbed for it. He took a knife and at three chops took off

the lid and handed me a brimmir g bowl of sweet water and cream. I drank and ate, but I am more of a carnivorous seal, than a climbing, tree-owning, frugiferous animal, so I wished for beef and longed in vain. About four we got to a rest house, and there we got beefsteaks and bitter beer. I ate and drank and was satisfied. Now this will let you know that I am in health, for green cocoa-nut and bitter beer would be apt to disturb the works of any ordinary clock, and my clock which tells me the dinner hour, was none the worse but rather better. I scratched my hands and bled considerably yesterday, there is no visible mark to-day. But if I have good cause to be thankful for the greatest blessing of frail humanity, I hear of others who are down with fever and dangerously ill hard by. So the serpents have and hold their footing in Eden still. I am going to a Badminton party at 4 P.M. to make acquaintances and do the agreeable to a lot of European ladies in the latest fashion.

I have nothing to say, and no news. I am going somewhere some day, and shall stay about Ceylon some time.

Meantime good-bye.

J. F. C.

No. L.

CRAIGIE LEA, April 21st, 1875.

MY DEAR MOTHER.

My last to somebody was from Newera Ellia, whence I started yesterday at noon with G. W. R. C. Three black breechesless men hoisted our goods on their turbans, a bronze policeman took them in charge; two well draped bronzes led up two white steeds, those who had the right kissed each other, I kissed my hand, and off we rode into the jungle. Down

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hill we went amidst creepers, and leaves, and thickets, alongside of a brawling burn. Sometimes we stopped to look at a strange black shiny creature with a thousand feet, moving in waves on the red path: sometimes at the tracks of an elephant, sometimes at a pile of chips, those of a carpenter-wasp, or at an ant, or at something else. Whiles we waded over gneiss rocks, whiles the path was a landslip, and we got off. But whatever we did we went down from the moon plains, and the barrack plains, and the heavenly abode in which I have been doing nothing for ten days. Presently we got out of the wood to a clearing. Some one had bought Government land to make a coffee estate. The Sinhalese woodmen had notched all the trees on the low side, and the highest had played French and English or Prussian soldiers with the rest. There they all lay with their heads down hill, on the top of each other. planters had gone a step further, and burned their jungle, and so everything was black and red soil. Then it began to rain. Next we came to an older estate, where rows of red holes had been dug, and where beds of young coffee plants were cradles of future fortunes. Then we got into a deeper ford and we were wet. Then we came to an older estate where the hill-side was green with coffee-trees, all pruned to one shape and size. Some in white bloom, some hung with green berries, some with ripe red cherries, which tasted sweet and pulpy, and contained white beans in paper covers. A white man in a solar hat, or a brown man in a white sheet and red turban, or a long-legged black bare bronze statue of a coolie stood here and there amongst the greenery, doing something. Here and there a neat house

with a fence of Adam's needle and bamboo rail, and a smoking lum appeared, and the inmates came out and answered our questions in h-less English or in Scotch Doric, or in whistling brogue. But all the time we went down, and the rain came down with power, pouring. I hoisted my Japanese umbrella; C. in his uniform got off and walked. Then we got to more rocky fords and got wetter than ever in water at 65° or 70°. So we sat on a wet stone, ate sandwiches and drank whisky, smoked, jawed, and studied the geology of pot-holes and contorted gneiss. Meantime all the naked men got into a group and stood under an umbrella of divers colours, while the white horses grazed, and the rain made everything glitter and shine that was not green coffee. Then for miles and miles we rode up through rolling green coffee-clad hills to "Patena" grasslands, past planters' houses adorned with flowers, and bananas, and aloes, and bleached bones of deceased elephants, and horns of deer, and shot-belts. Dandie Dinmont terriers came out and barked at us, big dogs wagged their tails, crowds of coolies, clustered about garden gates under many-coloured umbrellas, stared at us. Their wild tom-tom music sounded through the rain from their barracks near the pulping houses. Everything looked like peace and prosperity, plenty and growing wealth. Anything quite like the country I never saw. Coffee is about as picturesque as a turnip-field, and black stumps are the same everywhere. But a perfect green house of coffee in a ruin of black stumps reaching as far as the eye can see, amongst these round gneiss hills of Dimboòla, is something new. My comrade tells me tales of statistics which make my mouth water. An acre yields

about £120 sterling at the best, what it yields at the worst is nothing at all. Land sells for fabulous prices. Mortgages pay 10 per cent, in London quarterly. I have no money and I am too lazy and old to make money, but if the earthly paradise is on the top of these hills in Ceylon, the abode of Plutus appears to be Dimboola and the coffee plantations. Further, I am told tales of beauty, of magnificent mountains, the great western range and of Adam's Peak. But all that I saw was a foreground of green coffee and withered black burnt jungle, against a grey background of Scotch mist. Having topped a ridge, we got down to a river, and dusk came down on us followed by speedy darkness. From paths we had got to a road by a big river, to lights in houses, to fireflies by the wayside, to processions of Tamul coolies beating tom-toms in honour of something or of somebody human or divine. We passed shops lit up by tallow dips, graves dimly seen by the roadside, heaps of coffee refuse smelling as middens smell, carts with projecting yokes on the neeks of their bullocks, against which my white pony knocked my wet shins. All I saw was a yellow road with a figure in uniform and a pipeclay solar helmet, striding along in front of me, All I heard was the roar of the river, and the patter of a falling deluge on my paper umbrella. On we went and down the road jabbering and whistling and making way at three miles an hour, till we reached Craigie Lea rest-house about eight. A man in a tortoiseshell comb fed us with "devil" and curry, previous guests looked at us. We lit a rearing fire of sticks. I took off my wet coat, kept on my wet breeks, smoked placidly, and presently went to bed at Craigie Lea.

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Now from the name try to picture "Craigie Lea," and strive to take in what I see. In front rises a round hill covered with round green shrubbery, amongst which rise black stumps and tall dead trees. That is a coffee estate. To one side is a group of leaves thirty feet high or more. Some are whole, broad sap, green, beautiful things, some are split by the wind to the semblance of palm leaves. Some bend gracefully up, some rise and bend like a plume of feathers; among them, near the stems, hang green bunches of bananas, they are plantains, growing about the inn door, where ash-trees and cabbages grow in Scotland. A pigeon-house on a pole is under the bananas, a lot of draggled hens of the ordinary kind, and happy ducks behave as is the wont of their kind. The rain comes down splashing, the burn is roaring, near is the biggest fall in Ceylon, which is roaring for me to look at it, and I won't stir a peg. About the house, crouched in sackcloth and ashes, sit coolies, waiting to carry our dads to "Lochiel." There they have waited, and there they must wait for the weather to mend. The wind comes soughing round the hills, and waves the bananas, and rattles the doors wildly, the rain comes down, and the gutters pour incessantly. Here I am in a sort of tropical Scotland, wet and warm amidst my clan and old friends, with one Campbell, going to the house of another, near to Neill Gow's estate, in the same house with his brother-in-law; surrounded by Scotchmen and Indian coolies, and strangers of all shades from black to white, all come here to coin yellow gold out of brown beans grown in red cherries which men drink as coffee, "Apples," said I to the Sinhalese hotel-keeper, in

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the sheet and the comb, "give me a cup of coffee." "Have not got any," said he. "How?" said I, "Planters don't allow coffee at the rest-house," said the keeper, and so I had to drink bad English Chinese tea here in Dimboola, which supplies the markets of the world with coffee. What queer creatures men are! I am not going to describe life at Newera Ellia, of the many spellings and meanings. I there read Vanity I air when I wanted to smoke, and when I went into society I found the very same life which I have lived in London, lived by the very same kind of people. I thought them all very pleasant; they were very goodnatured to me. But old Thackeray would have made a Vanity Fair in paradise, if he had been there while writing, and he set me thinking with him up there in "Lanka." We had Badminton parties, and balls and races were just over. I went to a ball and I danced, but I got blown, and my head spun faster than my heels when I waltzed, so I found a kindred spirit who led me to another Campbell, who don't dance, and we three smoked and drank soda-water till bed-time.

Then I went to "St. Andrew's," which is the name of the hotel. Ever since I have been there I have heard the pattering of the feet of swarms of hurrying rats over my bed, on the camvas ceiling, on which also rain drips from time to time when thunder-storms come on. Amidst the patter and grow! 'heard a heavy swish now and again; my friends told me that it probably was a house-snake or a cobra.

Not long ago a lady was sleeping placidly in 1er dainty bed, the canvas ceiling burst, something heavy fell and awoke her. She reached out a hand, grasped the bight of a long serpent, and threw him on the floor. He was killed, and he was a frightened cobra. My namesake in like manner was fallen upon by a great "ceiling-snake," which he hurled off his bed. He lay there and roared till help came, and a snake was found careering about in terror on the floor. He too was killed. So now you see, if Ceylon be the earthly Paradise from which old Father Adam departed, he left serpents in possession; and those who prefer the night side of nature might make Vanity Fair of Ceylon. People do get drunk there, and tight and squabble, as they do where the seed of Adam have taken root.

So good-night.

J. I. C.

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Sugar Kandy, Saturday, 24th, 1875.

I have relevered my writing-box, so I finish my letter in greater comfort. After writing I went out and discovered a grand fall, tumbling over a hard rock into a deep glen. Behind it rose tall hills. On top of a knoll above the fall is perched a bungalow, which belongs, as I believe, to Neil Gow, grandson of the fiddler. He has gone home sick. The fall was seen through a frame of strange weird trees. One sent out arms at right angles, on which grew leaves at top. A great tree-fan, and a maze of leaves, and strings of the epers. hid the depths below the road in a green thicket. The rocks were clad in glittering mosses, all new to me; they were crowned by coolie gardens and houses, about which Tamuls in scanty garments stalked and squatted, me a, women.

and children, with silver rings on their arms and legs, and about their waists and necks, with gilt or gold ornaments in their ears and noses. Up the glen we looked at Newera Ellia, over the country which we crossed in mist and darkness the day before. Down the glen we looked towards the railway, past the Peacock rock. I tried to sketch, and the night fell and stopped me. So home we went, and dined and slept at Craigie Lea. Next day we were up with the dawn, and off by seven. We rode past the head of the glen with the fall in it, and up the burn of this fall to Lochiel. There I found an old Avranches sketch of my own doing, on which I signed my name for my namesake. His housekeeper's wife entertained us with soda and conversation, and showed Mrs. Cameron's photographs in Cameron's land, and us a coolie. Under his guidance our train wound up through coffee hills, wading muddy burns cumbered with logs, up we went till my glass marked 25.000. Then we got over a gneiss ridge, and down we went to the carriageroad in Dakoya. A shed by the way-side covered a couple of stone crosses, and a mound of red clay. It was a Christian grave. G. W. R. sat on it, and I sat beside him; there we lunched. Then we got into the carriage, and drove down to a police station. I ate bananas, and got a lesson in Tamul from a man in a white sheet, who had an English grammar. Meantime the police were inspected. Then we drove back to our sepulchral dining-room, past it, over a hill, and to a rest-house. There was a jockey with a broken-knee'd hoise; a track of blood was on the pavement. "What is that?" quoth I, to "Apples" the keeper. "Gentleman's leg," said he. A leech had got hold of a living meal. Then on we

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drove slowly, down a valley, passing coffee in all stages of "shuck," and "gone out." We have got to the last stage of coffee planting. We had seen hope and fruition, now we had got to decay and ruin. A man had paid £500 to another to take his land. The green trees had turned to withered sticks, and the ground was a garden of red, orange, and purple flowers. These were the bloom of a garden plant which some governor's lady introduced to the society of Ceylon plants. Like the foreigners of human kind, it spread and multiplied, and, being useless, it flourished, so that the natives are nearly smothered all over the island. We jogged on till we got to a gap and a station, where two brown policemen were put through their exercise by a brown sergeant. Meantime I sketched Adam's Peak, which peered over nearer hills, due south. Then on we went slowly in the cool of the evening. "Hi! there's a snake, and a deadly one," cried my comrade. "See how he goes up that wall of rock!" Down he leaped, whip in hand, swept down the snake, pressed him into the grass, nipped his neck in his finger and thumb, and presently the brute's gaping mouth was presented for my inspection as I sat in the trap. "Have you got a knife?" said he. I produced my pet pen-knife, which is for all manner of domestic uses, and, before I knew what was up, the point of it was poking for the scrpent's fangs. Then, as the snake was somewhat hurt, he was slain. How I did scrub and wash and polish that knife, and stab it into earth and sand! I am not quite comfortable with it in my pocket even now. Meantime feet had got into grass, and leeches had got possession of legs. Great black crawling bruces, an inch long, had got the slaver of serpents, and they

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bled him; I did not know it, but they had got me also. When I went to bed, I found thick worsted socks stiff with my own gore. By dark we got to a swarm of glorious fireflies. When we got to lights, I doubted which were the candles gleaming through the trees. Then we finished thirty-four miles, and stopped at Nawala Pitija, a railway terminus. We dined with many planters, speaking in all manner of English dialects of coffee. From sheer mischief I waited for a pause, and then shouted clearly, "Boy, give me a cup of coffee!" "Yes, sir," said the boy. Dead silence followed, but no coffee ever came, and I, grinning, went to bed on a couch. I was awakened by the swishing of something heavy on the ceiling; I asked if it was a snake, and the answer was, "Very likely."

Yesterday, Friday, we drove alongside the rail to Gampola Station. It was a beautiful morning, and the country was beautiful. Plates of mica shone like jewels when the rain had washed the red banks. Native coffee flourished amongst the tangle of weeds and flowers which mark the garden of the sluggard in this fertile land. Jack fruit, queer rough green egg-shaped things, stuck on their trees, each as big as a man's head, and good provender for those who like them and don't mind evil smells. Fruits, palms, bread-fruit trees, all manner of leaves and plants that I have seen grown painfully under glass at home, sprang rank and luxuriant by the road side amongst green grass, and guinea grass, and water grass, and jungle. The river, whose birth-place is the top of Pedro Tullagalla, now a well-grown brawling stream, eed with the soil of coffee estates, tumbled over gneiss and through banks of red earth beside us. Now and then a

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cobra was spied and hunted and escaped; then it was a white ant's castle that had to be stormed and broken; then it was a whole swarm of gorgeous butterflies that hovered and flitted about the flowers; then a long-billed toucan crossed the road; then a long-tailed mongoose ran over it, and so we made ten miles in about four hours, to rest the horse and amuse ourselves. We fed gorgeously at the rest-house. Then C. went to his station, and I dozed in a chair till one when we took the train. We got out at a police station. The men did their drill fiercely. I sat on a bench and tamed a black urchin dressed in silver bangles and nothing else. He crawled to my knees and poked at them with his black paws, for all the world like a hairless ape, with brown beseeching eyes. In another hour I should have been one of the police family. Then on we went to the great Botanical Gardens under charge of Mr. Thwaites. A small copy of the great Arthur Duke of Wellington is that excellent little man. He gave us tea and bread and butter, and beer and fruit, and flowers and vanilla, and he walked us for miles about his joy and care, the garden. He is charming, polite, instructed, intelligent, full of fun and knowledge, Everything about him shows care, understanding and good taste. The place is in a loop made by the river. It looks as if nature had made it; but peeps of the river have been carved out, views of the hills have been framed in thickets of bamboo and palms, and the whole is like an English park, saving that all that grows grandly here would need an English hot-house to make a twig sprout. Here were nutmegs in flower, cardamums, vanilla, bamboos yellow-stemmed and green, three feet round the stem-fruits from all hot a

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places, creepers crushing trees with their vast weight of greenery, groups of rare palms, thickets of ferns, devil-canes, rattans, every fruit that is good to the taste and pleasant to the eye, and that serpent in the garden together with the leeches to prove that Eden had come to grief.

The other Campbell hunted the snakes, Thwaites and I stripped leeches off our legs, the devil-cane nearly poisoned a man who pruned it and happened to put his knife into his mouth. Presently I was aware of a lizard with horns on his head standing on a tall tree; he had a red and orange pouch under his chin, which he blew out like an angry turkeycock. G. got him by the skruff of the neck, and he kicked and scratched and gaped to show white teeth in vermillion jaws; he was set on a white umbrella, and there he stood panting and furning and puffing as bold as the evil one. Then the little dragon was set on the gravel, and after a pause he went into the grass amongst the leeches, and walked up his tree as if nothing had happened. Then we got to the hedge over which we got in, and to the strange, flat-edged, creeping, crawling alligator roots of india-rubber trees. There we shook hands with the Duke of Wellington, and departed from this sweet place in the dusk. C. made me go out in the dark to look at things, which to me were invisible. He knew where they were, and saw them with mental or with bodily eyes. I smoked.

This morning we have been walking for miles in the Governor's grounds, up tall hills on fine gravel walks among a shrubbery of hot-house plants. We broke the cover of a white ant's castle to see the brutes at work. They are little white, soft, translucent beings, like bugs with red heads, and

they were exceedingly busy building under their roof. When it was broken a furious active red warrior of an ant, shaped like his fellows at home, rushed furiously into the crowd, as a robber chief might pounce on a swarm of coolies. Snap went his jaws on the soft white back of a white mason, and down fell the crippled architect grievously maimed. Off danced the warrior, nip went his jaws and another victim sprawled. A dozen were kicking in a moment. The news spread somehow, and a horde of red ruffians swarmed over the breach which we had made, dealing death and destruction. It was a furious inroad on a peaceful city with all the horrors of sack and rapine. Then the victors seized the dead, and carried them off to eat them, the cannibals! They made me think of my fair cousin going to the Feejee Islands. When I got home I read a letter from that young lady from Galle. By this time she is half way to Singapore. And now I must stop, and go see something else. I am to be here for a while and after that I am going elsewhere. I got no letter by this mail. Possibly you are writing to elsewhere. As I have not been summoned I shall not hurry home.

Anything less like Kandy of my dreams than Kandy in fact cannot be fancied. I looked for elephants and gold and brocade and grandeur. I see bony steeds, rattle traps on wheels, white sheets on black skins, and a muddy mill-dam behind a "Bund" which is the famous "lake." It is a sweet bright hot place amongst green hills, full of Scotch planters and coolies. But the Princesses of Serindib and their jewelled palaces are in the Arabian Nights.

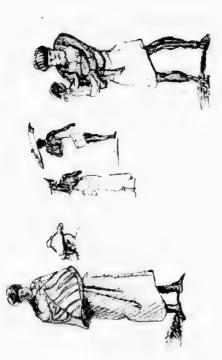
And so I wish you all as well and well pleased as

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ROADSIDE SKETCHES-KANDY TO DAMBOOL.

ROADSIDE SKETCHES-KANDY TO DAMBOOL

No. LI.

Dambool,
April 29th, 1875—Thursday,

MY DEAR MOTHER.

The last clause of this name ought to be spelt het. We started from Kandy yesterday morning at 7, and made 45 miles by 8 P.M. We drove up for some distance in a coach and pair, and then down to Mutale where Mr. W. gave us food, and Jon Duan to read. I liked the bodily provision best, for I was hungry, and the other stuff was sour and nasty. The morning breeze was cool and pleasant, the roads good, and the country quite beautiful. We drove up one burn, over a watershed, and then down northwards by a river which grew a little and then dried up. Palms, Breadfruit, Jack-trees, coffee plantations, flowers, birds, and butterflies, made the sharp hills gay and pleasant to look upon. Dark draped turbaned men stalked along between bullocks and carts with the air of emperors, and flashing mild dark eyes. Black and brown beauties with silver and gold and coral on wrists, and arms, and necks and ears, with white sheets round their shoulders, and coloured edges, with bunches of white and colours for bustles, and bare feet, sat breaking stones by the way side, or carrying earth and gravel in baskets of classical shapes. They looked like Greek marbles, Caryatides or such like, or living bronzes partially attired. Strings of newly-imported Tamul coolies met us, marching to earn small fortunes in Serindib, other strings of them laden with their scanty earnings wound along the yellow road on their way back to Adam's Bridge and India-of them one with a

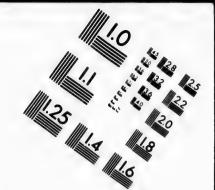
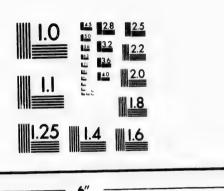


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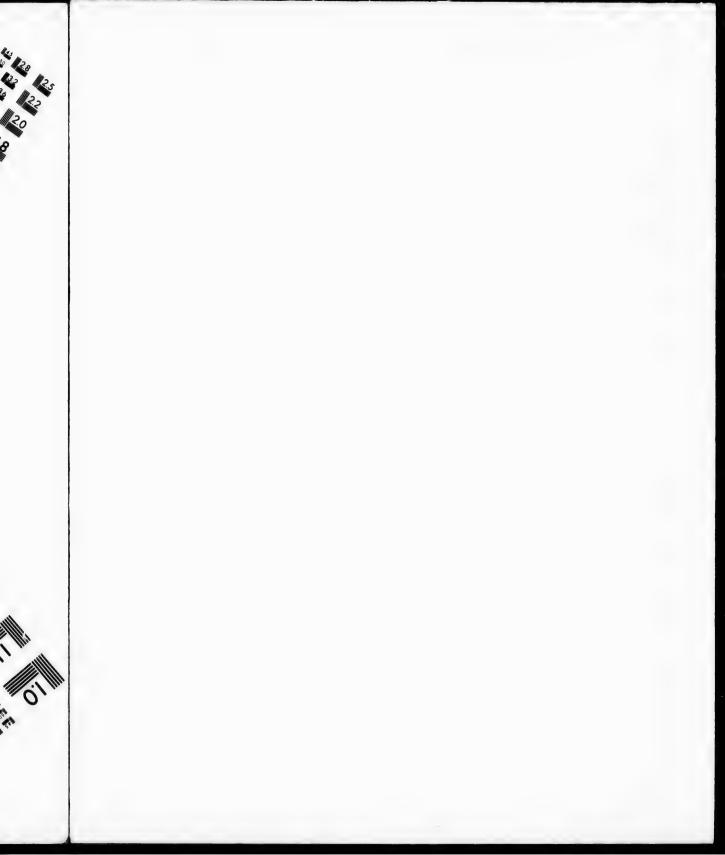


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grey head and a white turban met us this morning, First he knelt, and put his praying palms together. Then he fell flat on his face, and stretched out his arms and palms on the road. He had "a complaint;" I thought he wanted physic, but all he wanted was aid. Some of the stone-breaking road makers had stopped and robbed him, and broken his head last night, and he wanted two pounds odd, which he had earned in as many years. His head was felt, and two stout Malay policemen were sent off with him on the spot. Once more if this be Eden, the serpents hold their own in Serindib.

By dawn we were up, and by sunrise off to the top of a great rock in the jungle on which are a lot of ancient tombs and temples. The rock is gneiss, much contorted, and very glittering and crystalline. It is curiously rounded and very like glacial work. All the way up we found pot holes in various stages of growth, new and old, small and large, and just below the top we were shown a considerable pool in a rock basin. I was geologically puzzled, and began a serious hunt for icemarks. At last from the tip top, 350 feet or so above this rest house, I looked out over the country eastwards, and saw a great green plain reaching to the distant sea with rocks like islands in the green forest. I saw, or thought I saw, an ancient sea bottom with the old islands in it where the waves had left them. As for the pot holes they clearly are the work of rains. No rivers flow down these rocks at this season, but a little more than a week ago 10 inches of rain fell in a day at Colombo, and each of our heads was the source of a stream which ran out at the heels of our boots. So this rock, now I

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m 1 have been to the top, is seen to be the source of many local rivers which pour down it in thin sheets, leaving tracks of washed rocks with pot holes and sand in them. That part of the work done, we had time to listen to the barking of deer below us, and to look at strange cacti and the holes of ant lions in the sand. These beasts live in the sand, and at the bottom of a small conical pit an inch or two in depth. When any unfortunate insect gets in and tries to struggle out, the lord of this cellar throws sand at the victim, knocks him over and when he gets him to the bottom, he comes out of his A shorn priest in a sheet of yellow cotton, den and dines. draped like a Roman Senator, was our guide, and when he stood in the wind on the top of the rock he was a grand "Take care," he said, when G. C. went into a rocky hollow under a cliff to look at ant lions, "there may be panthers in that hole." There are elephants in the jungle and snakes everywhere, and white ants' castles rise everywhere among the greenery. Somehow one gets used to the idea of all these living pests, and the reality of them is not so bad as the idea. A leech-bite or two, and the occasional drone of a mosquito is the worst that has yet befallen me. We came down from the top and got round a corner through a white gate, and we were on the threshold of a temple as old as Buddhism in Ceylon. The priests say that it is 2,000 years old at least. For all these years the rains have been working on the pot holes-for how many more, who is to say?

The temples are small copies of Megaspelion in Greece, where I was some thirty-four years ago. The waves of the sea or the S.W. monsoon, and Father Time, have hollowed a

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great cave under a bed of gneiss. The under side of the bed is the long sloping roof of a series of large chambers, and a low white wall with posts and doors and windows with verandas and steps make the front walls of all these rooms. Inside they are so dark that I had difficulty in seeing. In one a great figure of Buddha is laid on its side with one arm under the head. The figure may be forty or fifty feet long, I did not measure and don't care for statistics. The whole is white and polished, and may be mud and straw as some say. Our priest said that it was carved out of the rock, if so the roof has been broken upwards like a mine to make the room. I looked for tool marks and saw none. The whole stone roof has the rounded form of an ancient weathered sea cave. is all painted in gorgeous colours. I sat me down on the step, lay on my back, got K's gift to bear, and studied the designs. In one large chamber a Buddha is seated on a kind of throne with rows of seated disciples to his right and left. Some are dark, some red skinned, some yellow. All have glories round their heads like pre-Raphael saints, and all are pre-Raphaelite, almost Egyptian in their stiff attitudes and hard lines. Amongst them, at the feet of the ancient Buddha, kneels a little figure who is to represent Buddha himself praying to his predecessor that he too may attain to the rank. Behind the main figure is a temple façade hung with golden ornaments rising in a series of columns and architecture towards the door, on whose step I lay on my back glowering through an aluminium glass at the roof. big figure has a big and very elaborate glory behind it; possibly it may represent some kind of screen. In it are patterns and scrolls, and rows of sacred geese, Hamsa, nine on

each side in a semicircle walking upwards and well drawn. They come out of a wild human face, and one with ears and ornaments is in the middle over the head of the main figure. The whole has a mystical meaning which these bright-eyed, In yellow-skinned and robed priests know well, but alas, I cannot speak Tamul, Pali, and Sinhalese, which they can well. In another painted chamber sit many figures in grim repose. Some are Lords of the Sky, Angels who brought the Scriptures from Heaven, Kandy Kings, and all sorts of say. creatures. One made of wood stands by a window in the court dress of his time. Above him on the roof are a series of pictures, and they, by the aid of the Malay Sergeant of roof It Police, and the Priests, told their story pretty well. In one compartment is a ship under sail passing over a sea of vertical waves, out of which many great white fish poke their heads as if they were peeping out of blue bags. The legend, filtered n a through Sergeant and Priest, is Viji Raja and his 700 Yodin (giants) coming from India to Ceylon. "Oudh men of course," said G. C.; "Nay," said I, "hito is a Jap' man, yette is Norse for giant. If these be Oudh men, then Odin and his Norse gods came from India too." A neighbouring picture shows lha the king and several giants marching over the land. Another, the king seated under a big tree in state, telling his giants that he will give them the whole land to make into paddy fields. Near that is a girl spinning. The king had found the daughter of the King of the Demons, Yakshana or Diavoletta, spinning. In the next compartment she stands entreating before the king with joined palms, and he with golden sceptre or sword threatens to slay her. She says, through my language filter, "If you send your giants to take the land, the

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aton Yakshas (or demons) will kill them. But if you will marry me I will save them." Near that is darkness, a marsh, a thicket of lotus leaves and flowers, and the head of one turbaned giant to indicate that 700 are hidden from the demons by Diavoletta in the dark. Then a little woman in a sarong and little else, Miani Chuana, the Yakshina Diavoletta, stands with clasped palms before a tall dignified regal personage, striking an attitude. Two fingers of his left hand are held up to bless her, his right holds the golden sceptre over his shoulder at slope arms, his toes are pointed outwards, and he manifestly is well disposed towards the little demon damsel who has saved his 700 giants in the lotus swamp. "If you will marry me," she says, "I will help you to kill all the demons." Next to this design, and next to the wooden image, is a strange sprawling white steed, Failaire as I should call her in Gaelic, prancing about with the king among a lot of headless black trunks, decently attired in the coolie dress of this country, and with several heads rolling all over the place. All the heads have curious long noses, and the same cast of face which is very unlike that of the king and his giants, "She became a Mare," says the priest, "and helped the king to kill the Yakshas, and he married her, and that was the first king of Ceylon." "I daresay it is all quite true," said G. C. "Probably a lot of Oudh men were blown over to Ceylon, and their leader married the daughter of the chief of the Veddahs and took the whole country." "Nay," said I, "I know of a Gaelic story in which a lady turns herself into a gray mare, and helps a man to slay no end of people, and escape and conquer a kingdom." And is not the story of the "Master Maid" in Dasent's translation of Norse tales founded on the same set of incidents, in which a "gray mare is the better horse." In short, here on the top of the Dambool rock I have tasted blood. I have got on the scent of my quarry. I have got out of a yellow-robed priest by the aid of a brown black-haired Malay policeman, the pith and marrow of a popular tale which I have listened to over the peat fires of Barra. I got another of the kind in the middle of Japan from a picture, and an interpreter, and a Shinto priest. In Scotland it is the Prince of Norway and the Princess of Ireland. Here it is the King who comes from the sea, and the Princess of the Demons on shore. In Japan it was the aunt of the first Mikado who was rescued from the Dragon with many heads. But in Barra, Japan, and Ceylon, at three ends of the world, the very same myths are fathered on the fathers of the conquering people and on their little demon mothers. We went on to the door of another temple, and there on each side stood quasi-Egyptian figures with serpent hoods. One big cobra looked over the head, four on each side completed the hood. "Naga Raja," said I, "Naga Raja," said the priest, and we looked into each other's eyes and understood each other. Language is but one of many ways of talking to another mind. We went into the temple, and there stood Buddha himself with a hood of three painted cobras above his white-washed and painted body. "The cobras made a hood for Buddha when it rained," said my filter. St. George and the Dragon, Eve, Adam and Eden, Fergusson on Tree and Serpent Worship, the Dragon myth, and all that I have thought and written about that strange world wide myth ever since I began to think about it, came trooping through my brains. I had enough, I was horribly

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hungry and hot, and so I bade the priests and their temple "Good morning," and came back here to feed on chicken curry, and ripe plantains, and tea. Since then it has been so fiercely hot outside that I have not dared to face the sun. Hence this letter.

I got your Times of April 1st on Tuesday.

G. C. sends his love-chin chin.

J. F. C.

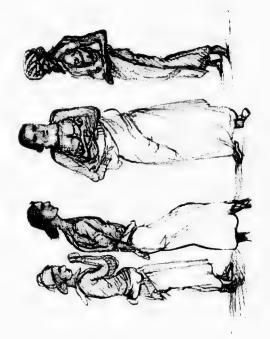
No. LII.

Anaradhapoora, Sunday, May 2nd, 1875.

MY DEAR MOTHER,

It took us two days to drive down here. Our chief incidents of travel were an elephant and a squirrel, first is a Government official and works on the roads. We stopped, and he made us a polite bow, and stood on three legs and hopped, and rumbled his inside, and blew his nose. and showed his politeness in other ways. Then he went to work. Some black men in the costume of Eden were rolling great stones with iron levers to make a bridge. Their fourfooted comrade got down on his knees and put his nose against a big block, and rolled it over and over, grunting till it was in its right place. Then a double chain was got round a bigger block and the workman straddled his legs over the chain, till he had got the collar to bear. Then he hoisted his trunk in the air, and set up a roar, and set off at a quick walk dragging the stone after him. When he got to a heap of mud, he got all his four legs together; when he got to a stone he strode over it looking like a big black man in baggy





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breeches. But all he did tended to the right end of his labours, and the stone slid and bumped into place beside the rest. Then the beast made us another series of salutations, and I gave his friend the conductor a shilling. The last we saw of the elephant, Gunputty, was standing under a shed eating a heap of leaves; his back was well dusted with mica sand to keep off flies, and his great broad ears played punkah. We lunched with C. the road officer, and left him and his live stock in their forest camp. We got to a ruinous rest-house. There were bottomless chairs and couches, a bare table and nothing to eat. With sticks the couches were mended and thereon we slept in the veranda among the mosquitoes. Two hens were got and slaughtered; curry was made, and we sat on the chair-frames, and fed sumptuously and slept soundly.

In the midst of our operations a small gray squirrel came twitching his tail over the grass. He leaped up a tree, sat on a branch and looked at us. He got on a broken tree end, jumped to the trunk, whisked round it, and played bo-peep with us for half an hour. Then night fell, and lizards began their games—chick, chick, chick, was their song. They crept up the posts, ran up the walls, caught flies and ate them within a yard of us, and finally disappeared in the roof and the darkness, singing chick, chick, chick, the requiem of the hens. Then an owl took up the song, and the mosquitoes sang chorus, and then I fell asleep and dreamed that I was going to be married What a terrible stew I was in at 4 A.M. when I awoke to breakfast on plantains and tea, and chicken curry cold, and start in the dark. We dawdled on for some twenty miles through the jungle to this city of

ninety kings. The trees are not tall, but so matted with creepers that it would be easier to get through a faggot. We cut sticks and picked up stones. Sometimes a toucan flew over the road; sometimes a black monkey toddled over it on a creeper, like a rope dancer; sometimes a couple of slinking jackals walked out to walk in again. Sometimes we come to open grassy glades with jungle fowl feeding by the thick brush. The cock with a shining golden tiara fed by himself like a rajah; the court ladies pecked by themselves in sober attire. When we stopped to watch them they all walked solemnly into the jungle and vanished. We came up to our second horse, "All right, Peachy?" "All right, sar. Last night cheetah close to road; he say, 'Grouth, grouth,' in the "What did you do, Peachy?" "We ran sar." "It was a frog, Peach"." "No, sar; it was a leopard." And so we dawdled on til the sun was high and hot over green jungle roads swarming with birds, and beasts, and butterflies, and blood-suckers. These last are lizards of curious ways. We saw one scarlet in colour, perched on the top of a whitewashed stone cross erected over a yellow grave mound by the wayside. A yellow white ant's castle commonly has a green dragon looking from the highest pinnacle. One who had chosen to turn olive-green was standing on a telegraph wire up against the blue sky. They suck no human blood, but they bite and scratch when they are bullied.

Here we are lodged in the house of the Resident. We have doors and windows open all day and night, and live in verandas and luxury. Mosquitoes sing at night over us; birds, frogs and crickets sing day and night in the green forest. A great creeper trained all over the roof, and all over

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the veranda, frightens me now and then with a crack like a copper cap. It has just burst a pod, then the winged cotton-like seeds fly out of their prison and fill the air with shining white stars. They come into the veranda and roll about there; they tickle my nose and hands, and get into my mouth and my glass and paint-box; and then comes a puff of south-west monsoon and the whole flock fly off with the wind to play games with the birds and crickets among the ruins. When I awoke this morning my room was full of wings. They fluttered and whirred outside of my net of gauze, and I dreamed of angels. I awoke to the knowledge that a roomful of bats were hunting mosquitoes. Then I blessed them, and slept till the light came and the bats went away. As I sit here writing I look down a long green vista with a spire at the end. It might be a village church in England but for the humped bullocks that are browsing and the long-haired Sinhalese who are walking there. On each side of the glade are ruins. On one side is a Dagŏba, said to be 240 feet high. It was a dome of solid brickwork with four minor chapels in a great square court. Outside is another larger square, grass-grown but paved. The whole was built some 2,000 years ago over some sacred relic. Good Buddhists have subscribed and repairs are going on. But the bricks have become earth, and trees have kicked them down and fed on them. So the dome has become a green conical hill with raw, red brick sides showing here and there. The retaining walls were buried and pushed out of place, but the sculptures were saved from the weather under the rubbish. They have been dug out and the walls are being mended and set up. There are Buddhas, and Rajahs, and dwarfs, and M VOL. II.

demons of marble and gneiss all over the place. Whole rows of elephants' heads look out of the walls, which they seem to support on their patient backs and bended knees. Seven-headed cobras under umbrellas of honour stand at the side of the smaller chapels. Every here and there is a grove of square stone beams leaning various ways among groves of tall trees. There stood a house, and these were the pillars. Sculptured pictures of the houses are on neighbouring slabs. Long inscriptions tell their tale to those who can read them. At the door of each house is a "moonstone" a half-circle sculptured. The centre is a lotus; the next ring, sacred geese; the next, scroll-work with birds and flowers; the outer half ring (Pop-There goes a pod!) a procession of elephants, horses and humpbacked kine. These and all the details are real works of art. They are the best "Indian" sculptures that I have seen. There is something Egyptian about the figures, something Italian about the tracery. This city was about eighteen miles through every way. Now it is jungle, jungle and red ruin over the whole area, except at a few chosen places of pilgrimage. Here is the sacred Bo-tree. It was a branch taken from that Indian Bo-tree under which Buddha died and attained Nirwana. It was planted 2,600 years ago here, and here it is without a sign of decay flourishing still. Last night I was there in the dark. Inside the railing stood yellow-robed priests and pilgrims from afar, each with a tiny lamp glowing like a firefly. They were burning camphor and offering rice to the sacred tree, and giving coin to the priest solemnly as men did when this was a populous city and the green mounds were gilded domes. It was a strange weird scene. best worth seeing of any Sinhalese sight that has gladdened my eyes as yet. All round the Dagŏba are fluttering flags and stone chapels for pilgrims to offer at, and all this has been going on ever since a city as big as London was abandoned.

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The Tamuls came in from India, and the last of the ninety kings skedaddled. Nobody looked to the walls of the tanks and so the country became the wilderness through which Great-Britons are driving roads. "Bang!" there goes a gun followed by a tum, tum, tum. On a place which would be the village green of the Bazaar, a reset-up two candlesticks of brass, eight or ten feet high, with a brazen copy of a dagoba, a lot of flags and mats, an altar and the money-box. These are offerings to the shrine of the Bo-tree by rich Buddhists of Galle. They are on view for pilgrims and their pence. I once read a whole series of Buddhist tales, and I saw that the best way to Nirwana through heaven and earth was through a priest's bag. The merit that met its reward in all these tales was charity to priests and self-denial. Bang goes another gun! And now the fierce sun, who has been glaring on all this tree and serpent worship ever since men abandoned the worship of the sun and Indra, is getting lower in the sky, and less terrible, so we are going out for a wander in the ruins.

Two letters will go together, and I and my sketches will follow them soon.—Salaam.

J. FC.

No. LIII.

Dambool, May 6th, 1875.

MY DEAR MOTHER.

Last night I slept on a couch with all the doors and windows open. We sat in the veranda and watched lizards of divers sorts running up and down the posts and along the beams. One mottled fat puffy saurian has the reputation of being more deadly than any snake. He did not keep me awake. But when I was going to put on my shoes this morning I saw somebody sitting in the heel of one shoe. He was a house toad, and he hopped off round a corner, into the sleeping-room of my comrade. Presently there was a hooroosh in there, and I was summoned to look at another creature. He was as big as a small crab, with pointed feelers 3 or 4 inches long, and with eight legs, of which he carried one pair bent in towards his mouth. They were armed with fearful hooked claws. The owner ran forwards and backwards, and sideways with marvellous agility, and he was a gruesome bedfollow. He was caught and imprisoned under a tin can on a sheet of paper. Chloroform was sent for, to the nearest coolie hospital, but none being forthcoming, the stranger was finally slain with a stone. He is a very rare and curious spider, happily for flies. Malabar pheasants, otherwise jungle crows, are whooping all about this rest house, and the trees are alive with chirping crickets and cicadas. We have no lack of company in this Ceylon jungle. I spent the morning in cutting sticks, and a coolie is off with a bundle on his head. Those which I sought are thorns. The spines are about 2 inches long, and grow in pairs alternately at right angles. Consequently each stick has 4 straight rows. From other thorns of longer growth grow smaller thorns, and still smaller thorns, the grandchildren of the family grow from these. When I stuck my head into a bush, the whole thorny clan stuck into me. I had a policeman with an axe, and he took the offenders into custody, and cut their career of crime short—to the length of a walking stick. Then I amputated the smaller offenders with a penknife, and the docked criminals are to be transported to London bound with cords of coir.

Destructiveness is human, so we destroy. The night before we passed at a rest-less house on grass and sticks in the open air. At sunset a troop of jackals set up their pipes and sang, "Dead Hindoo, dead Hindoo—where, where, where—here, here, here—come and eat him, come and eat him." I recognised the words and the song, though I had heard it for the first time in the forest. I thought of P. and his keeper. He got a jackal for his special ends, and next morning he went to see his acquisition. "Well, how is the jackal?" said P. 'I think, sir, he must be ill," said the English keeper. "The poor beast howled so last night that I sat up with him."

We had five o'clock tea with a charming lady; her husband is a road surveyor. Her house is a shed on posts with walls about 4 feet high and the rest air. A pet monkey was tied to one post, and another was up on the top of a tree filling his pouches. After a deal of coaxing he slid down a creeper, and was captured and embraced. It was queer to see his black phiz among white muslin, near fair cheeks

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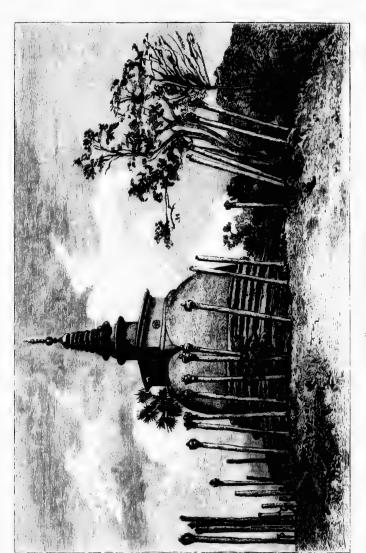
rees no ning his while his black paws held on by a gold chain, and his tail dangled beside a silken sash. Lady, pet and house, and dark-skinned half-naked servants, tea and cakes, and jam from home in the jungle were incongruities. But they are to be found all over those colonies on which the sun never sets; where brave women fight gallantly by the side of Great Britons in beards.

Yesterday we lunched with young C. and Mr. B., an engineer. We fed on hare, and curry and rice, and talked of the glacial period to cool ourselves. A deer about as big as a rabbit ate leaves on the floor, two terriers and a pup devoid of tail made eyes at the deer. A big sleepy tom cat, the gift of the lady in white muslin, would sit on every vacant chair and go to sleep. A monkey in a biscuit box on top of a pole suggested a photographer focusing the lot. Black masons were whitewashing a yellow mud wall, and building a bathroom. White ants and creeping things walked about the roof, and the elephant was near at hand working on the roads as before. A tank, said to be full of alligators, was dimly seen through the trees. At this moment G. C. has brought in from the bathroom a cinnamon frog with a green and yellow belly and bright eyes. He is set on the table before me, puffing and blowing and wagging his throat, a most ludicrous private secretary. There he goes hop, hop, to the other end of the dining table, and now he is making for my tobacco bag, under which he is trying to hide. Here comes "Apples," an old black man in a red turban and white draperies, with a handful of yellow plantains for me to eat, and water to fill the filters. This is my "East India Company" in Ceylon. The frog has got under the spout of s tail, and jam are to never Great

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DAGOBA AT ANARADHAPOORA

DAGÖBA AT ANARADHAPOORA

a brown teapot, and there he sits, fully persuaded that he has got under a stone. Through a country so peopled we travelled for two days northwards from the mountains to Anaradhapoora. There we stayed two days, and thence we travelled back for two days to this quaint holy place. I could have spent a far longer time among the ruins sketching and watching the pilgrims, but G. C. wanted to move, so we travelled.

The old capital of Ceylon has seen over 2,000 years, and is eighteen miles through every way. It was too hot to walk far; but so far as I walked I found heaps of hewn stones, rocks, and rubbish, overgrown with tropical plants and tangled trees and creepers. Here and there a long green glade is open, and at the end is a brick dome, degraded to be a cone, and overgrown with trees. These are Dagobas. If you want to know all about Dagobas, read Fergusson on Tree and Serpent Worship. Devout Buddhists have taken to restoring these ancient shrines. Down one green glade I went, mounting steps, and getting down broken flights which marked the outer walls of the court. Then I got to a grove of gnarled trees, which bear a beautiful white perfumed flower. With these the way was strewn by the winds, and by the pilgrims. At the foot of the mound I came to an old stone covered with black ashes, and bits of camphor and wax, and flowers, the burnt-offerings and gifts of the pilgrims. In front was a marble wall, from which the red talus of fallen brick-dust and rubbish had been newly It leaned forward, but it was fresh and unburt. moved. At each side of an off-shoot chapel stands a figure in basrelief, well sculptured and graceful, dressed in the draperies which men wear here now, and adorned with armlets, and bangles, and necklaces, and earrings, as men still are who can afford these braveries. Behind the head and conical tiara of this gure rise these strange hoods of seven cobras' In his hands each bears a tree in a vase and a branch. In a lower compartment is a female figure, with two cobras rising behind the head. Next to the figures are sevenheaded cobras as large as the men, coiling and twisting. Of these, one has clearly-cut dogs' faces, with forked tongues and the serpent's hood. Of these monsters I never saw specimens on paper or stone before, so I made some pencilnotes. Then I looked up and saw a lizard a foot long, pacing slowly along a ledge of marble turned red with brick-dust and rain-water. I brushed the dust from the sculpture, and came upon a painted necklace of flowers, with the cotours as fresh as if painted last week. So this whole wall is a study for an artist or an antiquary. The beauty of form and colour, and the perfume of the whole place, were a delight for anybody with eyes and nostrils and brains. I got back in the dark. The Resident made a raid on a big snake, which escaped among stones laid at his door to make a new room. That was not so pleasant, but nobody seemed to care a row of pins. While sketching a snake in marble at the foot of another great mound of ruins, a lot of pilgrims came round, with their left sides to the centre, and clasped their hands, and prayed and muttered. A man in a snakepattern sarong, with naked body, long black hair in a knot, tortoiseshell comb and earrings, came to look at me, showing his white gleaming teeth. I looked as pleasant as I could, and we were soon as thick as thieves. He has been to sea, s, and who onical cobras' and a th two seveng. Of ongues er saw pencillong, with m the s, with whole auty of were a ins. I a big o make seemed irble at ilgrims clasped snakea knot, howing could, to sea,



HEAD OF NAGA

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and his work is to supply steamers at Galle with vegetables. He pays coolies to work at these ruins. "Buddhist religion good," said he; "no do harm; do good," "Yes," said I, gravely; "and give money to priests." "No, sar," said the Buddhist pilgrim; "priest no take money." I thought of the box, and changed the subject. "That old woman say prayers to that Naga?" I asked. "No, sar; that all the same for curio." "What for she say prayer?" "Inside that Dagoba image of Buddha eighteen arms high" (here he touched his elbow); "and four lamps of sapphire, and Buddhist book, and plenty thing, silver and gold," said he. "Sometimes when men pray, the book speak." "But how about that Naga?" said I, thinking of Fergusson. "Oh," said he, "these Tamul coolies no good; they take stone away and things. If man take them, serpent come and bite him.' "Will they bite me," said I, "for drawing?" "English Government good; mend this place," said he. "Serpent no bite master." "What are all those ashes on that stone?" said I. "That," said he, picking up a bit of camphor, "that offering; I burn plenty camphor there last night, and cau de Cologne, and perfumes." Only fancy eau de Cologne burned for Badcha at Anaradhapoora by a bumboat-man in a sarong. "That stone Yodin work," said the pilgrim, pointing at a giant lotus that the biggest elephant in Ceylon could hardly roll over. "Giants!" said I. "Yes!" said he: "all this Yodin work." "Who were the giants?" said I. "Ceylon giants," he said, calmly. By this time the sun had come over the top of the mound, so I had to escape. "Good-bye." I said. "Good-bye," said he, grinning: "I hope to have the pleasure of seeing master again." And so we parted, I much

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the wiser for our interview. Next morning I saw my friend coming from the sacred Bo-tree with a lot of his kind. They came to a grove of granite pillars—about 1,600 of them which were the ground floor of the Brazen Palace. They all squatted down and prayed, kneeled, clasped their hands, muttered, and prostrated themselves towards the pillars and towards the rising sun. There is nothing sacred about the Brazen Hall, so possibly they were saluting Indra, Phæbus the Sin, Bel and the Dragon. "Good morning. sar," quoth my friend, when his orisons were ended, and we had another pleasant chat, A friend asked what I said. "The Rajah says," explained the pilgrim. I never was a Rajah before, but I was glad to find that value upon the Gaelic word "Righ" out here in Ceylon. Then I went to the Botree, and thought over everything of the kind, from the Garden of Eden downwards. The story of the tree is, that Buddha attained "Nirwana"—i.e., he died under a Bo-tree in India about B.C. 500. The Rajah of Ceylon, when converted, asked the other Rajah for a cutting. The other was willing, but "How shall I dare to cut that sacred tree with any instrument?" Advised by a priest, he took a vermilion pencil and made a mark on the tree. Thereupon a cutting came off and descended into a vase, and was carried to Anaradhapoora and planted, and there it has gone on growing ever since. The connection of ideas is Buddha and the Bo-tree, which last was sacred before Buddha. But serpents are clearly mixed up with this old tree religion. At the door of the outer inclosure are four coiled snakes carved in stone, with wax newly offered on the head of one. He is coiled on a lotus flower. At the next door are two graceful figures,



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SEVEN HEADED NAGA, ANARADHAPOORA, CEYLON

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with tall conical caps and the hood of seven-headed serpents (Is-hatta-Nagà). The one to the right holds a branch in his left hand; in his right, a vase, with a growing plant in it, probably the miraculous cutting. Two quaint dwarfs, as high as his knees, hold and manage his draperies. figure at the opposite side has all the lines and hand offerings reversed to suit the architectural composition; otherwise it They are called Durutu pàle, door-keepers. Maniis alike. festly they have to do with the tree, and the snakes and the dwarfs probably were the ancient divinities converted, like the men to the worship of Buddha. tells that Indian gods worshipped Buddha, and that they may in time, by good acts, promote themselves to be Buddhas. Dragon monsters, which my guide called alligators, make the side walls of the flight of steps. Cobras come out of their mouths, and their coils crown the dragons. At the threshold is a moonstone, adorned with elephants, horses, lions, oxen, thirteen of them walking with their right to a central lotus that is to say, they are marching sunwise round a thing which may represent the sun. All the ornaments on these stones-leaves, twigs, birds, &c.-grow or move in the same direction. Now, I have watched the creeping plants in the jungle for forty miles, and they all coil with the left side towards the centre "widershins," as creepers do north of the tropic of Cancer. So I have come to the conclusion that the march of the beasts sunwise on these moonstones, which are trodden under foot, has to do with that old northern astronomical worship in which men followed the course of stars and heavenly bodies round some pillar or sacred place, as the shadow goes round a gnomon in the North. Traces of the

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custom survive in Scotland and Ireland and elsewhere. Here it is grafted on the tree, and in active growth. Here the sun now passes to the north of me, and my shadow goes widershins the other way, as the creepers go round the trees. But for the greatest share of time the sun travels as it does in England. On the very altar of the Bo-tree, in the outer side of the inner wall, among the black ashes of newly-burned camphor and wax, and white flowers, is a newly-offered clay image of a cobra coiled, painted and adorned. Thus all round the tree, which has been worshipped for more than 2,000 years, and is daily worshipped now, are serpents and signs of solar worship; and these dwarfs, who have turned to fairies, demons, kobbolds, and all the strange, under-earthly creatures of popular tales and Highland superstitions. I never felt the value of my "rubbish" so strongly as I did when I saw that clay serpent amongst the flowers strewn at the foot of the Bo-tree, sacred to Buddha, but holy before he was born. The door of the inner shrine is quaint, and unlike anything I ever saw. The keystone of the door is a monster head, with glaring eyeballs projecting. From the mouth pour the ornaments of the doorway-flowers, scrolls, scales, and conventional dragons' heads swallowing the scrolls. Two upright figures, with drawn swords and plain hoods, stand one on each side. Two snake-hooded, tree-bearing janitors, like the first lot, guard the steps. I found many like them elsewhere. I waited, glowering and dreaming till a boy with a shorn poll, a bare right shoulder, and a canary-coloured plaid over his shoulders, brought a big key. Then I went up, and found my head on a level with the upper platform. Through it grow two large branches and one smaller, without a sign of

age about them, fresh and vigorous, covered with long-tailed ere green leaves. I tried to find some way to the covered sun trunk of the tree itself, but way there was none. It is all lerbuilt into a castle of brick. Many large branches fell lately, es. and were solemnly burned. Many large trees of the same oes kind are all about the inclosures, and the oldest trunks have ter fresh shoots. I suppose that the sacred tree is a bunch of ıed saplings, I got down, and the serpent tempted me to lay commit sacrilege. The yellow boy left me to attend on a lot all of dark ladies who had come to offer rice. I was alone with an the only policeman in the place. I asked him if I might cut nd a palm-leaf for a stick. He said "Yes," so I cut two. We to got to the back of the yard, out of sight of priests and nly pilgrims, to a fallen Bo-tree which the wind had felled. I ver thought of Esculapius and his disciple the doctor, and I aw grasped my knife. "If I were to cut a branch off that tree," of said I, "what would the priests do?" "They would do rn. nothing to master," said the police; "they would say nothing g I to master; but they would think in their hearts that it was ith very bad." The man in the tortoiseshell comb is a Roman a-Catholic. His gentle eloquence of tone and eye and speech nvanquished the Tempter, and made me use my knife to cut a ht pencil. There was no Eve to make me take forbidden fruit, on and I took none. By the way, this ficus religiosa bears no he fruit, and the leaves are burned when they fall. I got out of re. that sacred tree inclosure with my palm-leaves and a clear  $\mathbf{r}\mathbf{n}$ conscience, and went home to breakfast, and then we started er at noon, and drove through the jungle in the heat of the day nd till the shadows fell eastward and we got to our ruined rest it house, from which even the master had retired. So we got of

here; and here I am in a geological puzzle. From Galle to the north of the island the rocks are sandstone and gneiss, folded from east to west, striking north, and traversed here and there by dykes near Galle. The central province is mountainous, up to 8,000 feet. The plains which surround these mountains are studded with hills, which are rocks; of these many are rounded, as rocks are in glaciated countries. The low plains between these islands in the jungle are smoothed, worn rocks, thinly covered with angular gravel of their debris. Some, as here, have caves near their tops, which are made into temples. They look like sea-caves. On top of some are large loose stones of the same rock, gneiss. Dagobas are on most of them. Here and there in the forest are large stones, still of gneiss. In the north are coral rocks and recent fossils. Here there is nothing but gneiss and angular debris of gneiss. It looks glacial, but I believe it to be ancient sea-work. Of one thing I am quite certain: the shape of this whole land is due to carving as plainly as is the shape of the seven-headed cobras at Anaradhapoora. My puzzle is how the sea ever contrived to cut a plain and round it in this fashion.—Salaam. J. F. C.

No. LIV.

DIDIROYA, Friday, May 7th, 1875. 0

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MY DEAR V.

I owe you a letter, so here goes. I have been writing log to your mother, this is the sequel. The glass stands at 89°. I am sitting in a shed by the wayside, amidst flags, and bunting, and white sheets, and strange gear hung up in our honour by the Rat-in-my-hat-nya, or some such dignitary who is a country laird or lord-lieutenant of a country or

something of the sort. In front of me is a plate full of green e to oranges, yellow limes, and plantains, and a glorious pine-apple eiss, with a grand compound crown, a "hen and chickens." A mile from this place we were met by a band of tomtommers, they had white turbans on their heads, and white robes round their waists, silver bangles and earrings on their dark skins. Their black eyes gleamed and their white teeth shone as they grinned welcome. Three old ones with grand beards and porare tentous "bicepes" carried large single drums, two young ones, of whom one was exceedingly handsome, carried double kettle-drums, and all had fists and crooked sticks. They formed in front of G. C.'s white horse, who had quietly dragged us through the forest, and with a wild prance and a military quick step the five drummers began to strike and to stalk. The patient white steed tossed his nose in air, and danced into the place where a ditch ought to be. "Hi, o be stop!" shouted the driver; "you musn't do that," and the whole procession was stopped. We drove through crowds of men in silence, got out, and found breakfast. I begged leave for the band to perform. The old men led, prancing wildly about in a kind of quadrille, advancing towards the young ones, who played their double instruments with all the skill and rapidity of French rolls. The old prancers bent to one side, and cuffed, and beat their drums till they roared and howled. I sat in state in an arm-chair, and expressed my entire approval in a neat speech. We gave a guerdon to the minstrels, the crowd scattered, and we fed sumptuously in our shed. The Rat, &c., is a man of good descent, who holds this title under Government. The agent had sent him to get

this place in order for us, and he had got up this demon-

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stration on his own hook, I believe. The crowd were the people who drove elephants through this forest for the Duke of Edinburgh, and according to the police reports may be murderers. We got the old swell in, set him in a chair of dignity, and made him civil speeches through an interpreter. He went away.—Presently came a man bearing a pot of "nice cool drink from a high tree-very cooling for the body." It was toddy from a palm. Then came two king cocoa-nuts, great yellow eggs full of sweet milk and cream, inside of a beautiful shell. While I write, I hear shots, and here I stop to accept a jungle cock and hen. The first I intend to deprive of his hide presently. This, an it please you, is travelling in state as a friend of the Government agent, and the Governor, and with the Superintendent-General of Police. I am not sure that it was not better fun in the morning. A horse was sent on early last night, and we started with the other about a quarter past six. We had not gone far when a wonderful creeper, like a brown frilled ribbon, as long as a tree brought us down on the road to look at it. We hooked on and hauled till the tree bent, then the creeper lost its hold, and the whole wondrous plant coiled itself about our feet. We stood staring at it, for neither had ever seen the like. Then we cut lengths and coiled them up and started. Presently we got to a rivulet of beautiful clear water dancing over granite sand. under a green festooned tunnel of forest trees. Of course I had to seek for gems. I found mica, quartz, and garnets, but nothing worth carrying off. The water was full of green frogs and little fishes, and fresh-water crabs, who ran about in the pools, glittering in the flickering sun. There was a fresh breeze, and a cool green shade by that purling streamlet

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the first we have seen for weeks, and we longed to stay there and rest. I found a lot of old white shells; we threw them into the water, and the fish ran away with them, fighting for the spoil. We got on to clearings through which grand green conical mountains, which here stud the plain, showed like islands. We came to muddy pools full of muddy mousecoloured buffaloes with great horns. They got up lazily, or rolled over and stared at us. Youthful and foolish buffalo calves walked on tiptoe through the green clearings to stare at us, and tucked up their tails, and fled from the terrible presence of the white horse of the Campbells. Thereby hangs a terrible tale with a prophecy in it fit to make a Campbell's hair turn as white as the horse's grey tail. I think you know it. The chief does, and so did Breadalbane. Many a time have I thought of it as I followed these white horses through Ceylon. Then we came to a thicket, and got out to look at a desirable walking stick. "Look here," quoth G. C., and I looked at a long creeper which curled through green leaves away into the darkness. A whole army of brown ants had chosen the plant for a road. They were marching swiftly up in thousands. They carried nothing, and none were coming back. I tapped the stem below. A whole squad scattered and ran under to see what the earthquake meant. There was nothing, so they joined the ranks, and the stream of soldiers marched rapidly on. I got a glass to bear on them, and they dazzled me. I never saw anything like that moving mass of living things, except the French fête de fraternité at Paris in 1848. To see where these were bound we must have climbed tall trees, so we left them. Then we got to a garden full of plantains and king cocoa-VOL. II. N

nuts, and all manner of quaint fruits and flowers. We stopped at a wayside hut, bought and ate and drank for sixpence such things as gold would not buy at home. We got in, and the spare horse came up, and there was a picture. A brown Sinhalese man, with large brown eyes and long straight black hair, and a tortoiseshell comb in it, held up a bright classical brass vase in his bare bangled arms and The long-nosed black horse-boy with his red turban, and slender neck, and sharp dark face, bent his head and drank. The white horse, with the sun shining full on his satin skin, cocked his ears, and poked his nose under the red turban to get a share of the water from the yellow vase. The background was made of plantains and palms, and forest trees with strange roots, bamboos and eaves, and a wealth of fruit hung under a straw shed from which curled the blue smoke of the fire from the rice pot.

I measured a tree with H's gift, and made it 180 feet. I measured the stem of a tree cactus, and made it four feet round. I stabbed a branch, and milk ran in streams. Up and down we drove over the roots of the mountains for twenty miles, with something new and strange and beautiful at every step. We had the whole to ourselves, and it was glorious. Then we got to the band of music, and all was curious life, but we had to be civil instead of savage, and that is a bore. Now I must go and take off the bird's jacket.—So no more at present from J. F. C.—Sinbad.

P.S.—He had dined on seeds, beetles, and snail shells; we dined on him, and he was tough; you shall wear the spoils in your hat.

No. LV.

KURENEGALIA, Sunday, May 9th.

We drove here seventeen miles in the early morning, pottering and enjoying life. "Look there," said G. C., "at that prickly pear with the white blotches on it, that is a disease which kills that horrible weed. It was found that a single leaf, carried to a district in India, soon cleared it of prickly pears, and that was a great discovery." "Let's have a look," quoth I, so we got down. The whole plant was covered with blotches of white downy stuff, and I suspected cochineal. I poked about in the down, and poked out a beast. and the beast very soon showed that magnificent crimson blood-red which nothing can beat. We squeezed one flat, and there was no doubt about the fact. Here was the insect in profusion. "Now G.," quoth I, "here is a vast country run wild, growing anything, and everything that men cultivate in tropical plains, and a tangle of jungle and forest trees; and here is a source of wealth and industry running wild like the jungle, and the sun's rays, and other gifts, which mortal men will not accept." "Let's smoke;" so we smoked and toddled along the road. "There's a snake's skin newly shed," quoth G., who has sharp eyes for serpents. It was gathered up damp, and smelling of snake strongly. I have it carefully wound round an old stocking, inside of another, and you shall see it. "There—look; there is a paddy-bird," said I, this time. There he sat, a great white curlew crane heron-like bird, with a grey head. A lot more were stalking all about the green fields pecking. One had got to the nose of a great

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buffalo, who was browsing and wagging his ears, and twitching his tail to drive away the flies. The paddy-bird danced, and pecked flies and ticks off the mouse-coloured face and black nose of the great horned crittur, and he seemed to be exceedingly pleased by the attentions of his white friend. We left them at it. "There are wild parrots," said my comrade. I looked and saw specks like emeralds amidst the sap-green of the growing rice. I got my aluminium eyes out, and there they were, a shoal of pollies, as busy as sparrows in a barn-yard. One fellow with emerald-green wings and tail, sap-green body, and a shining beak, had got himself up on a clod against a red bank of earth. What a beauty he did look in the morning sun. "What are these fellows doing there?" said I, pointing down the road. We got to them, and found a party sent on by the Rat, &c. (lord-lieutenant of the county), one carried two king cocoa-nuts for us to Another a bill-hook to cut them. A third jabbered and pointed, and then I remembered that we had asked about Dagobas. Manifestly a Dagoba was near, and we were to look at it. It was precious hot, so we held a debate. Pluck had it. We walked a mile over dry rice-fields, and through paths to the foot of a queer round bare rock. Up there we climbed and there was the Dagoba. It is white, shaped like a handbell, placed on a square tray, with three shrines. The fourth, E side, is open to a shrine at the foot of a sacred Bo-tree. with footprints of pilgrims in the sand going sun-wise round the holy tree. In a shed near is a mud Buddha greatly dilapidated, with remnants of a glory or a snakehood, I am not sure which. This rock, like the Dambool rock, has many pot holes in it. Some are large and full of dirty rain-water.

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The look-out from the rock, a hundred feet high, was over green hills and plains, with scarce a shadow or clearing in the landscape, except close to our temple. We got back streaming. "There's a cane," said G. There was something like a bamboo leaf with a soft thick bark and thorns, like hooked-needles on a long climbing stem winding about in the bushes. I cut a bit, and peeled it, and out came a smooth hard beautiful switch, round as a peneil, which I have been chewing ever since. It was some kind of rattan. So we got over our pottering drive, while the sun grew hot and hotter. The wind blew and nobody cared. About ten we got to the house of the government agent, who had left all in order for our occupation. Here we are at the foot of the great Elephant rock, from which the place is named. I sit in a wide veranda hung with horns and with elephants tails. The nest of a tailor-bird hangs on a nail. Books, tables, glove-boxes, flower-pots and dainty plants show the taste of the lady, who is up in the hills. A litter of puppies, shot belts, and whips mark the pursuits of the gentleman whose acquaintance I made at Newera-ellya, my absent host. A lot of sculptured stones show that we are on the site of the palace of the king of this old capital of Ceylon. which has vanished into the jungle. The stones lean against the stems of magnificent India-rubber trees. Their roots coil about above ground like alligators, and flat-sided snakes or lizards. Air roots drop from the branches and take root, and become new trunks. The branches meet overhead, and make a pleasant green shade, and therein sit "coppersmiths." They have been hammering like bells ever since we came. Too-Too-Too—as regularly as a clock. Then two of them join—Tootoo—Too-too—Too-too—then three—Too-too-roo—Too-too-Then four, or more go at it, and do Handel's harmonious blacksmith's hammering an anvil to perfection. I have not got my eyes on them yet, but they are little birds. I was up before light this morning, and soon after dawn I was off coatless, with a shirtless, barefooted, breechless, black person to carry a bag of instruments. We walked in the shadow of the great rock up a smooth hog back of gneiss, much contorted, or possibly fused. That took me to a square inclosure, and inside that to the "Shri Pada" (holy foot) cut in the rock. The supposed foot was six feet long. I lay down in it to measure. It was the right foot, and it went towards the N.E. The ladies of this country could not walk to Anaradhapoora, so the Rajah about 200 years ago made this Shri Pada for the ladies to worship. Here is a Dagoba, but no Bo-tree. Here are no carved naga stones. But here are two trees called nagà (snakes). They bear a white flower with four leaves, and a round yellow centre O, like a wreath of everlastings on a French tomb. It is a holy tree. It bears no fruit. Near these snake trees is a temple. Inside sits a Buddha, with two standing Buddhas, one on each side. A pair of tom-tom beaters, and a couple of conch blowers are painted on the door posts. On the roof Buddha is painted with a glory round his head, an umbrella over it, and the Bo-tree with its rat tailed leaves over all (Bogaha). "Alla lia," sacred flowers, of which I send one, are painted on the roof, and strewed on the altar. To the right of the central figure on the roof is a Naga Rajah, with two snakes looking over his shoulders; he has a grinning case of formidable teeth, and the pair of buck teeth which Darwin

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ADAMS FOOT, CEYLON

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attributes to primeval men. To his right is a black-bodied elephant-headed person, supposed by me to be Gunputty, God of Wisdom. I find that I was right. He is an Indian god converted to Buddhism, one of that more ancient Pantheon. To his right is an alligator-headed Next a man with long teeth, and brown man-monster. two fish-like snakes looking over his shoulders. Then two more men in the dark. Six in all. To the left is (1) a toothy figure with a sword in one hand, and a snake in the other. (2) One with a star spangled tambourine over his head. (3) A figure holding a cobra in both hands. (4) A black figure. All this painting is fresh. The priest and an old unintelligible rushing-to-conclusions Christian Peon, who ran away from all questions with wild answers, gave me to understand that all three statues were Buddhas, that all the others were his friends come to fight with him (for him). It seems then that some of the Gods of Indian mythology were ranked among Buddha's friends, and that his chief friend was Naga Rajah with buck teeth, and snakes on his shoulders. Something like a procession of snake charmers was in the artist's mind, when he made the picture, and the people on the left. So snake charmers represent the ancient religion, which is connected with a holy twisted Naga tree. So we get back to "tree and serpent worship," connected with Buddha, who preached B.C. 500 or thereabouts. How I wish that I could talk to these people. We went on to the top of the rock, 700 feet, and then came down by another way, at an angle of 29° to 30°, in many places, on bare rock. I took off shoes and stockings, and got down with whole bones. I got a bath and breakfast, and now I have written this, which is going

to post forthwith. We have a three days' drive before us to Colombo, and after that I suppose that I shall take to the sea, and trot home. This is the hottest month, and this is the hottest place in Ceylon. I don't mind it a bit for the air ', but the glass never goes below 80°, and the rocks burned my bare feet.

Good-bye.

J. F. C.

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No. LVI.

GERIOOLA,
Monday, May 10th, 1875.

MY DEAR MOTHER,

I have a letter to you, and one to V. in my "bag of tricks," because I could get no stamps at Kurenegalla. Three of my letters at least ought to arrive by the same mail. Possibly I may travel with them. "Such is life, and the post." We were up at four this morning. I took great pains to see by the light of a candle that there were no centipedes where my feet ought to go, and secondly that there were no frogs or snakes in the bath. Then I thought myself an ass, and went to breakfast. A lot of puppies came and untied my shoe strings. A lot of servants sleep nightly on the floor of the veranda, among the puppies and their fleas. While munching a plantain, I heard a whack outside at the door of the "parlour." Then another whack, and Sinhalese voices. I took a candle, and lo! there lay a long curly snake, newly slain with a bamboo. "Is he a bad one?" said I. "Yes, master, very bad," said the barefooted appold in the red turban, who had just brought in our tea by that doer. "In the midst of life we are in death," said G. C.

solemnly, and then he proceeded to handle the writhing body of the deceased. "I don't believe he is dangerous at all," he said. "What the deuce brought him in here then?" said I. "He was prowling about for mice, or frogs, or lizards, or flies, I suppose," said the other, calmly. I had just met a couple of dark toads at my bedroom door, hurrying away-I suppose they were escaping. As I sat on the door-step a few nights ago, a couple of frogs dropped flop beside me from the eaves. I famly believe that they meant to drop on my hat, and missed. Last night at dinner, a pretty green bright-eyed tree-frog climbed up the silvered glass pillar of a lamp—he was put on the table. Not liking the publicity of a white tablecloth he hopped on my sleeve, then he jumped on to my shoulder, and crawled on my back, and then he got to the floor and departed by the door at which the snake was slain in the morning, among the puppies, by the servants.

Sinhalese society is charming in the dark hours. Yesterday I made acquaintance with a dark gentleman of good family, who is "modliar," that is to say, a great swell. He showed me old gold and silver mounted swords and combs of ivory, and betel-nut boxes of gold, old books, and his young family. The lady mother sticks to native dress and language. The father speaks excellent English, and his daughters have been educated by an English governess. I was also shown a yellow parrot who ought to have been green, and much civility. Then I took my leave, enriched with photographs. The old gentleman gave me a sequel to my Dambool legend. The first king of Ceylon, he said, was bewitched by a Rakshas damsel, and he married her. My

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hat C. first story tells me how that came about. But when the king found out what she was he discarded her, and married a woman. Then the Rakshas changed into a great venomous snake, and came to the door of the king's room, and began to blow venom through chinks and holes, to kill the lady whom the king had married. But a guardian genius cut her into small bits, so when the king and queen awoke, they found a pile of fragments of the Naga lady outside their door. That is a new bit of the old dragon myth.

The Naja Rajah who is sculptured about Buddhist shrines is the ruler of the Naga, (serpent) country, which is under ground. They have great riches and beautiful women. When the people wish to compliment a beauty, they say now, "Is she not as graceful as a Naga maiden?" The Nagas have the power of taking human shape, and then they bewitch men as the lady bewitched the first Rajah of Ceylon. Here is that "curious myth of the middle ages," Melusina. Now possibly the slain snake of this morning may have been a Naga damsel who knows that I am a bachelor. The genius in my case was played by appold with his bamboo lath. I am sorry; but such is life. Our day's drive was over excellent roads, through a beautiful country, in a pleasant breeze at 81°. Quaint bare rocks rise from two to four hundred feet above the plain. The plain is a kind of rolling gneiss sea with waves on the strike north and south. The dip is nearly vertical in general. Yet all the outlines are rounded curves. The tops of these stone rollers peer out from under the roots of great tree cacti, and cocoa-nut palms, and the wild mat of trees and creepers which men here call a jungle. The stone breaks naturally along this curved surface, and shells off H there have gnei That daily cool give outs bece crac thir can dov oug we in ord

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have hit an idea. Yesterday I came down barefooted on a gneiss rock, and nearly burned my feet where the sun shone. That great heating process is of daily recurrence, and the daily heat must penetrate an equal distance, for the nightly cooling must stop the march of the sun's rays. Thus for a given depth these bare gneiss rocks must daily expand, outside of a colder shell, and so in time a Ceylon rock becomes like a crackle cup. When the rains begin the crackle shells off. If that be not the true explanation I can think of no other. May the Naga maidens entice me if I can make anything else of their rocks. We were up and down picking flowers and looking at sticks all morning. We ought to have seen some ruins, but we missed them. Here we found an open shed by the wayside and a tame squirrel in a cage, and breakfast prepared by excellent Peechy, the orderly. Here I sit near a big river among palms in a charming breeze, with plantains and mangoes beside me, cocoanuts over head, and coppersmiths and Malabar pheasants, and golden orioles and song birds making music near and Our steeds are stabled behind us, and stand there chumping grain. A small procession of coloured Vatican statues and bullock carts goes to and from the ferry. If only these Naga maidens will spare me their company when I go to sleep on a stretcher in the dark, my life in Ceylon will be pleasant if it be wild. Picture to yourself Hercules and Apollo in ebony and bronze with a couple of Amorinos. Some with, some without coloured draperies and head gear, seated in a two-wheeled cart, behind a young humpbacked,

mouse-coloured, horned, high-actioned bullock, trotting ten miles an hour through a grove of palm trees; the heathen divinities laughing and grinning and whacking their steed to make it go faster. That equipage has just whirled past in yellow sunlight. An Apollino arrayed in a string has been grinning at me over our half wall. He and a yellow dog have just wandered down the road to the mud and palm branches in which they dwell.

My glass stands at 89°, and it seems needless to wear anything in such a climate. When we started, the warm yellow clay floors of the verandas were strewn with people, rolled head and heels in white sheets, sleeping there like white marbles on Roman sarcophagi, but more picturesque and graceful, because alive. They don't mind centipedes, frogs, toads, spiders, and snakes. Why should I?

COLOMBO, Thursday, May 13th, 1875. My

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Here we arrived last night, in good case. We started from the camp by the river at dawn, and waded the ferry. I could see no rolled stones, yet this river runs thirty feet deep in floods. That night we got to a police station, and camped there, as the second horse had gone astray. Next day we got to Negumbo through groves of cocoa-nuts and cinnamon. There we fed sumptuously. What we ate and drank I hope to tell you later; also how men gather toddy here now.

I find that I must hurry-scurry, so I add no more.

Salaam.

J. F. C.

No. LVII.

Colombo, Ceylon, Whit-Sunday, May 16th, 1875.

MY DEAR MOTHER,

Three of my letters are to start with me in the French mail from Galle to-morrow, and this will join the party and go home faster than I. I have written to Bombay to send my letters home. It is too hot to travel about India now. Possibly I may find it too hot to travel about Egypt. In that case I shall go on to Marseilles, and possibly get home before the year of wandering is ended—some time in June. Make me some stockings for I am nearly barefoot.

I don't think that I have ever told you what I got to eat. As a housewife with a good cook it may interest you, so here goes for family information. A very pleasant, athletic old gentleman who had been along our road printed advice to travellers and told them to take "everything." Above all, they were to carry beds and mosquito curtains, a filter, and a lot of chickens in coops. The result in his case was a train of dark-skinned bearers streaming along the road with all these things poised on their pates. As soon as I got clear of the adviser I begged G. C. to take nothing instead of everything. He would take some tins of sardines, or a of salt butter, and several of preserved, nasty meats, and these have made the round and are here except the butter, which ran away. I fancy it came from Finland; I believe I have seen it there, and it was nasty from the beginning. Now the fashion of white men in this land of plenty is to live as if they were in desolation. They feed on tinned soups and rags

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of stewed beef years old, they eat raspberry jam and cranberries from beyond seas, and gooseberries, and they are of that species for so doing. The fashion of the natives is to go into the jungle, and cut down creepers and dig up roots, and climb palms for toddy and king cocoa-nuts, and feed on curry and rice, and the kindly fruits of this glorious earth on which they dwell. Therefore I argued that we could do without "everything," and we did very well indeed. At our last police station the sergeant provided long chairs and two sofas, which were placed in an airy shed made chiefly of woven palm-leaves and bamboo. In the midst was a table of large size, on which was spread a coloured cotton cloth. I believe that it was the dress of somebody. We expressed a wish for breakfast. There was a rush and a scurry and a lamentable noise, and the flock of chickens lost a brother and sister. A dark Malay beauty, wife of a constable, took to cracking cocoa-nuts and rolling jungle spices and pepper under a round stone. A constable went to market and returned with pine-apples and plantains. Somebody plucked mangoes off a tree. Tea was got; knives, forks, and spoons were borrowed from men in the village; and out of our nothing grew a very pretty little feast, which I could not furnish in London for many pounds. Our horse had taken a wrong road, so we dined as well; and next morning we had an excellent breakfast of plantains smashed in sugar and milk, and coffee all grown in Ceylon, and costing next to nothing. The sergeant valued the whole at a rupee. Of course he got more; but that was cheaper than an army of fifty coolies to carry nasty, old, northern, dear, stale beef and cheesy, salt, hairy butter. As for beds, the couches were cool

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and soft, and my plaid did its usual duty, while my bag became pillow, as is the wont of that article when I travel. Tropical mosquitoes do sing and bite, but to a Lappland wanderer they are simply ridiculous. Further, I always argue that strong drinks are a mistake. The planters and other guests at Ceylon hotels begin with a "peg" of brandy and soda. At breakfast they commonly drink a pint, often a whole bottle, of champagne of execrable quality from tumblers into which blocks of ice manufactured here bob uncomfortably. For the rest of the day "pegs" are popping at the bar continuously, and heated men cool their reddened noses on miniature icebergs floating in fizz. More moderate men drink I drink beer when I can get it. But when I cannot I drink tea, and then mosquitoes and leeches do me small harm. Ticks and the other small deer often lame and lay up people who put themselves outside of "pegs." They do it in Lappland; they do it doubly here in the heat. We got a bottle of beer from an officer of a local court, and we enjoyed it at our police-station dinner. Next day our drive was towards the sea and Negumbo, through cinnamon and cocoa-nuts and arrowroot, all growing luxuriantly in sea-sand. I saw a man in a cocoa-nut grove armed with a big knife. His garments were Nature's, adorned by a turban and a belt of linen sheet, from which dangled a great black earthen pipkin surnamed a chatty. We stopped, he stopped. Then he caught hold of a hoop made of a palm branch, one of a series arranged like the hoops of a sail on a mast. He walked up a very tall palm-tree as easily as I might up a gentle hill. He took a small black pot from beneath the stem of a palm-flower. emptied it into the pipkin at his waist, cut a thin slice off the flower-stem to make it bleed, and then he walked backwards down the tree with the gait and agility of his four-handed progenitors the Darwinian apes. He had been up to get "toddy." Out of that he gets a fresh morning drink, beer at noon, and arrack when the stuff is fermented and distilled; out of that he gets drunk sometimes, and thus a headache and cholera. The whole of this big island of gems is set in a ring of green cocoa-nut groves which yield oil and toddy, and curry, and fresh milk—and this is the country in which white men carry "everything."

At Negumbo we got an inn breakfast of fresh f tead of tinned salmon, with prawns three inches long, curry and rice, and fruits, and milk. After it I sketched from the breezy veranda. Those marvellous flying prows came out from their holes in the swamps and jungle in shoals. They rushed past the inn door in a smooth shallow lagoon with the speed of a railway train. I never saw anything with sails fly like them. The hulls are dug out logs, twenty yards long. Above is a narrow slit hardly wide enough for a man's leg to stand in. The crew sit with legs dangling over into the water, or stand upright. The boat could never sit on the water alone. But from the side project two long bamboo bows, and at the end of that double lever is a solid log in the water. The sail is a great oblong sheet hoisted on the arms of a bamboo triangle, and fast at the end of the boat. The outrigger is to windward. When it blows hard a man crawls out on the bamboo fiddle-bow. If it blows harder he goes further. If it blows very hard two or three men get out of the boat and sit in the sea on the log. They go anywhere in any weather, and the harder it blows the

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faster they fly. As the men wear less clothes than naked coolies, and the sea is 85°, these fishers are nearly amphibious. It was beautiful to see boat after boat run out of the cocoa-nut gardens, fly past, turn, and become almost a line end on; wheel round a wading prawn-fisher and whisk off to sea through yellow sand and white surf. It was beautiful, but very hard to draw. So I looked and smoked; and listened to a thunder-storm which came and went its way heralding the S.W. monsoon. The cholera, by the way, was very bad at Negumbo. As we drove along in the cool of the evening to this town, we stopped to see a cinnamon harvest. We walked in at an open gate, and through a lot of trees about the size of currant bushes at home. At the end of a road was a shed, and we walked in. On my right, with one foot on a sloping stick, sat a lady with a big knife. She laid a strip of bark on the stick at her heel, and then with the knife she scraped under her knee with both hands and the knife. It was a pretty graceful quaint action. She was scraping off the outer skin of the cinnamon bark. The shed was full of people, men, women, and boys. The head man, to please us, got a stick and peeled it. He took a blunt brazen knife and cut along the bark. Then he beat the stick, then he poked in the brazen point, and the bark came off like a pipe, or a half-pipe. Next it was scraped, then all little fragments were packed into the cinnamon half-tube, and tubes were thrust into tubes till the whole was of the right length. Then a cinnamon bark "stick" was laid on a pile like it, and the sun dried the lot. I saw bales being tied up and sewn in canvas later at Colombo. I got a bit and munched it in that garden, and straightway I was six years old in the housekeeper's closet out in the

western ocean on a Scotch isle. Not one of us could converse with these landowners. So I lit my pipe with a crystal ball, and they exclaimed "Diamond." We parted, mutually saluting in our several foreign tongues, exceeding polite and much pleased.

A little further on G. C. spied a little brute like a large grey polecat or a little otter. It was a half-grown tame mongosling, or youthful mongoose, routing about in a shed. We stopped and the beast skedaddled for a house. His master brought him in his hands. G. C. took the baby and nursed it in his claws, while all the village stood round and grinned. The lissom little brute twisted and scratched, but he did not do much hurt. All he wanted was to get out of the hands of the Superintendent-General of Police. He was loosed at last, and the speed with which he scampered off home to his master's house rivalled that of the flying prows at Negumbo.

We passed through crowds of people and got safe to Haarlem Bungalow, which is a regular Sinhalese house, big enough for a small army. There is a large mongoose tied to a post with a string. In a cage is a sulky palm cat who bites. In another is a tiny little lemur with large beseeching eyes, and something that suggests a frog and a bat about his limbs, gait, and voice. He is slow and sleepy, a terror to moths and flies, a rare animal, and about to die like three of his family. Out of two large boxes some hundreds of clay pots have been drawn. They are curious, hideous and Sinhalese. One lot are serpentine. Another lot partake of jungle cock and cobra. Others are monsters of the kinds that stalk about the moonstones of Anaradhapoora, but degenerate. Others are taken from Dutch dolls manifestly.

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Others are portraits of modern men. One vase I take to be

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a copy from some Grecian drawing. But whatever they may have sprung from, the ideas are all turned into quaint Sinhalese monstrosities twisted into water pots and oil lamps. I might have the lot, but where to put live animals and brittle crockery I know not. I might also have a great pile of manuscripts written on palm leaves in characters unknown and an unknown tongue. They are poems like that translated by Steele. I have persuaded mine host not to give me these gifts. I have got from him a lot more Sinhalese stories translated into English by natives, and these I bring home, having learned most of them already. We two live here alone and entertain friends. A general order was given to bring different fruits daily, and that is done. I have eaten papau and jack fruit, dong and jack-fruit seeds, mangoes, limes, pincapple, plantains, and things wonderful excellent and nasty. One is like butter and rotten eggs and bacon, but that I have not found here luckily. It grows and smells abominably at Singapore under the name of durien. . A wood apple here is something like it. I am alive and well, and enjoying life. By half-past six P.M. I am to get into the Galle coach and embark from a place in which cholera has been really very bad and still is raging, like the Superintendent of Police down there, who is making war on decaying vegetables and dirty water like a wise sanitary man. By noon I and my family of letters and my boxes and bangles and bags hope to start. And how we get on I hope to let you know later.

Failte, J. F. C.

<sup>1</sup> Kusa-jatakaya. By Thomas Steele. Trübner, 1871.

About dusk we started in the carriage and drove slowly to the post office. There we met the coach, and put my traps into it. Then we drove slowly along the coach road. gas lamps began to shine, and the day went out. And still we sauntered on before the coach. At last I called a halt. Then up came a trap full of friends who exclaimed: "The coach has gone." Tableau! Then one asked if we had met a coach. No. They had. Then it was surmised that the coach had turned to seek us. Then a distant horn was heard approaching, and the coach came. We all shook hands, and off I went to the sound of the horn. The governor's aid-de-camp was on board going home, and a namesake teaplanter. We smoked, and jawed, and fell asleep. The rest of my nocturnal impressions are composed of moonshine and cocoanuts, the sound of the sea, the horn and the horses. By dawn we got to Galle. Two hours later we were in the Mei-Kong French mail, and ever since we have been steaming homewards.

Tradition.—Here at one of the angles of the old world is a fit place to say something about Eurasian popular tales.

Fifteen years ago I wrote as follows:—"If mankind had a common origin, and started from the plains of Asia, and if popular tales are really old traditions, then the tales of Ceylon should resemble those of Barra, and the tales of Japan should resemble the others; because men travelling eastwards and arrived at Japan could not easily advance farther. Mr. Oliphant tells us that both in China and in Japan groups are commonly seen listening to professional story-tellers in the streets, and it is to be hoped that some one will enable us to judge of their talents." (XVII. Popular Tales of the West Highlands. 1860. Vol. I.)

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After that my friend Mr. Mitford began, and writers at Yokohama are at work now:—"Let a sufficient number of incidents be gathered together and treated as roots wherever they may be found, exactly as ar and tra are hunted through forests of Aryan words, and storyology will become a science like any other ology." (310, Vol. IV., op. cit., 1862. Edinburgh: Edmonstone and Douglas.)

A French writer has so treated the subject in 1875, and has reduced the number of root-incidents to fourscore. I think that the number is far greater. I have some hundreds in one story.

Most writers on this subject get their knowledge from books written by other writers. A French author lately published "The Popular Tales of Great Britain," and kindly sent me a copy, with a handsome letter to say that if his book has any success in France he owes it to me. He translated tales from a number of English books, and many from one of mine, which contains a small portion of a large collection which I myself made orally. The French author also wrote an able preface, and therein is a theory founded upon his knowledge of books. As he has done so writers are apt to do. Those who have taken knowledge from books look on them as the fountains and well-heads from which rivers flow to irrigate the minds of men. But men think and talk before they write; tradition is older than writing; and the great majority of mankind utter and hear thoughts because they cannot write or read them. Popular lore is orally taught, learned, and collected.

The people from whom I have gathered my harvests have

Loys Bruevre. Paris: Libraire Hachette et Cie, 1875.

no knowledge whatsoever of books, or a very small knowledge, which does not include printed popular lore.

I have often hunted the pedigree of a story. I have traced it back from mouth to mouth, from one country to another, sometimes through a book, always to a reciter of tales at last. Those who have travelled in wild countries know that all over the old world the telling of stories is a human custom. Professional story-tellers, oral historians, novelists, preachers, and ballad-singers are numerous in Japan. In Tokio they have regular stands, and beats, and an audience. Practised story-tellers wander about England, and are welcome guests at wakes. In the uttermost corners of the Scotch Isles, and in Ireland, men aboung who can neither read nor write, whose houses were frequented in winter evenings by crowds of eager listeners. The Church condemned the practice, and so I had to wheedle and coax knowledge out of old sinners who told novels, instead of writing them; who taught Gaelic instead of Greek fictions; who sang about Fionn and Graidhne, and knew nothing earthly about Mars and Venus, or Helen of Troy. A friend gathered popular tales for me in Ceylon. Before I set out in 1874 I had some knowledge of three angles of a triangle whose sides take in most of Eurasia. Friends helped me in Central India, and in the mountains which bound the North of India. Books helped me in Norway, and in Russia, in Germany, and Turkey, in Persia, in Lappland, round the northern verge of the old world, in America, and elsewhere. I knew that certain incidents arranged in order make the skeletons of tales which are told all over the area of that big triangle whose southern corner is Ceylon. I had said that much to the Ethnological Society

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for the sake of my old friend Mr. John Crawford, my godfather, at the Athenæum, whose memory is green amongst his old friends.<sup>1</sup> It is the custom all over Eurasia to tell stories for pastime, and to recite poetry. True it is that many of these stock stories had got into written books long ago; but many never were in any book that I know, and seem to be as widely spread as the rest.

It is asked, How came these stories to be so widely spread? I got a horse-riding story from Minglay, which is three miles long and one mile wide, and 900 feet high out in the Atlantic. There was but one old pony there, about as big as a big goat. The man who told the story could neither read nor write; he had never worn shoe or stocking or bonnet; he was over eighty; he spoke Gaelic only; and he had never been far from his native island; yet this man had a regular wild horse-riding story about a terrible black steed that I have never heard tell of. I thought that I had got hold of an ancient Celtic story of pre-historic times. I went to Minglay and heard the story, and asked the reciter, Rory Rum, where he got it. He got it from his son, who is a soldier, and he got it in the West Indies, where his comrades used to tell stories in the barrack-room at night. Another son was a soldier in the East Indies, and a comrade led him to hear a professional story-teller there who was reciting another horse story, which old Rory tells to storm-staid fishermen out in Minglay for a quid of bacey. It is called "The Blue Mountains." I do not know how Rory got that atory, but I have it in Gaelic.

Memory is the best portable library, and a man's

<sup>&</sup>lt;sup>1</sup> March 22, a paper was read, which was printed in the journal, p. 325.

head the best conveyance for oral mythology. The use of a book is to record for posterity, and to elevate lowly thoughts to the lofty minds of men who have learned to read. Myths are cephalo pods.

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By wandering, I have got to understand wanderers, and to realize their ways of learning and teaching and thinking. At Nijni Novgorod a fair is held every year. I was there September 6th, 1873, with a memory stored with popular tales gathered in Scotland. With me was Cyril Graham, exgovernor of Hudson's Bay territory, who had collected the traditions of his North-American Indians, who cannot read books. I saw a sea of mud, with islands of packing-eases in it—tea, iron, cotton, fur, matting, and sundries; "about which wade and scramble Tartars, Circassians, Russians, Armenians; porters, carts, horses, carriages, and the descendants of the builders of Babel." I know that these people, who came there with goods from Siberia, China, and the Caucasus, from Persia and elsewhere, tell and listen to popular tales while travelling in caravans and boats. It is the same everywhere. The Mohammedan pilgrimage draws men from Java, from Canton, from Ceylon, from Central Asia, and from Eastern, Central, and Western Africa. When it has been shown that one man, able to speak two languages, has passed from one place to another, that is enough to account for the migration of that man's knowledge. Had we two travellers turned tale-tellers in Russia, our knowledge might have spread over the northern hemisphere without the aid of pens and paper. I have carried a whole library of popular tales round the world myself in mental pigeon-holes. For me, therefore, this has ceased to be a question.

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Men and myths migrate together.

I know that folk-lore abounds in Ceylon. I have read Miss Frere's book, Old Deccan Days, and know what a harvest remains to be reaped in India. I have seen trains of natives of India in Ceylon, coming and going, migrating in crowds in search of work, and carrying their earnings home. Knowing that men's minds are the same in kind if they differ in power, I know that these hordes and all other hordes are carrying popular history and mythology, fables, novels, and tales, which they scatter along their path for children to plant in their minds, there to grow into a fresh crop of like growths, varied by different circumstances, like foreign plants in a new soil. In Ceylon I have seen many races of men-Malays, Moor men, Arabs, Sinhalese, Aryans and non-Aryans-all mingling, and learning languages and traditions to carry home. I find many religious and many earnest missionaries. When I find the judgment of Solomon told of Buddha, I suppose that a missionary taught that Bible story, that a Buddhist converted it into a sermon for his own uses, and that a native remembered the incidents, and dressed them and placed them where they were found, in Ceylon. I see my way through the book which is most taught and translated.

Believing that story to be true, it was told before it was written, it was learned before it was read; and so oral teaching goes on aided by writings, but orally and independently wherever intelligent men wander and converse.

Stories which were in old Sanskrit books are told in Ceylon with Bible stories, and with them stories which seem to be the same which I have heard and learned in Japan and in

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the West Highlands of Scotland. Of them some at least are not in books.

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I know of my own knowledge that men migrate and travel; I have learned that they have done so from the beginning of history, before books were. I know that tales and traditions which men remember travel with them, and spread from their mouths, through ears, to other minds. I know of my own knowledge how myths travel. They travel with men.

If one old British arm-chair upon wheels grew into hundreds of thousands of perambulators in a few years in Japan, one mental store of knowledge may grow as large a crop as a thistle when the north wind shakes it and scatters it.

The popular tales which I printed in a book were reprinted in newspapers and spread all over the earth. I myself set men to gather popular tales in Scotland, in Japan, in China, in Ceylon, in Fiji, and in many other lands.

The translator of the "Popular Tales from the Norse" started me, Grimm started us all; and all who have collected popular tales orally know of their own knowledge, as I do, that their best hunting-grounds are the minds of those whose sound memories are least encumbered with knowledge derived from books. I found that out long ago. This last circuit gave a wider foundation for my opinion to stand upon, and so I plant my post and mean to stand by it.

Traditions are very rarely derived from books, but many books are derived from tradition.

This looks rather like the schoolboy's declaration of war:-

<sup>&</sup>quot; 'Here stands a post; Who put it there?'

<sup>&#</sup>x27;A better man than you; Touch it if you dare.'"

But it is not so meant. Many who think differently from me are far "better men," from whom "I take a licking," but they are scholars, not vagrants. I am a vagrant, not a scholar, and so I write as a professor of oral science might lecture over a camp fire to other ignorant readers of minds, who think and speak for themselves, having no learning. Trees grow from seeds; small things grow big; epics grow out of ballads; Shakespeare's plays grew out of stories and traditions; men rise to be heroes, and some have been promoted to be heathen gods. Excelsior! But when a new or the true religion appears, these false gods descend to be myths, and men, and monsters, in the mouths of story-tellers, and in the minds of wise men who despise them all as "lies." Lower they cannot go. But at the next turn of the wheel up goes tradition into a bookshelf to be classical, and to be taught at Eton, and at universities all over the world, from classical dictionaries. Like other things, so with mythology.

> "Here we go up, up, up; Here we go, down, down, down, -a; Here we swing backwards and forwards, And here we are fairly a-ground-a."

Nursery Song.

So it is with myths and with babies who delight in oral mythology and hate lessons. Therefore I say no more here about one of my favourite pursuits,-the pursuit of useless knowledge amongst ignorant men, "pro dilectatione stultorum."

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No. LVIII.

RED SEA,
Wednesday, noon, May 23rd.

MY DEAR MOTHER,

Yesterday we got to Aden. What there was to notice in the Indian Ocean is in a horribly slow paper, which I have been writing all round the world, which I copied out on board this ship, and which nobody ever will read, as I suppose because I have put some work into it. Nobody ever does read such things except the writers. The most remarkable thing I saw was the triumphal arch erected by the elements for the entrance of the south-west monsoon.

The sun rose behind us in the usual solar fashion, which poets have likened to everything under the sun—from a boiled lobster to a fair woman. I was watching a goldencloud island with a snake-cloud dancing over it, and an alligator crawling towards it, on the horizon, very like a whale; T—— was agreeing with me, like the courtier in Hamlet, when it occurred to us to look ahead. There to the west of us was fleeing night, and indigo, and violet, and a falling screen of tropical rain. On it was the rainbow Bifrost of the Norse gods, solid enough for the ghosts of heroes to ride over, and bright as the gems of Ceylon. It was more than a half circle, for the sun was below our horizon, and it was the grandest triumphal arch that ever was seen.

The monsoon that Germans have explained to be the march of Indra to battle with Ahi, the snake, was marching over the sea towards India, and we were steaming into the mensoon. Thenceforth it rained and blew; waterspouts got

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up and waltzed about us, and so we passed through the arch and the battle till we got to Africa and Cape Guardafui. Then we got to Aden, where the tanks are as dry as chips. I was up at two to see the entrance. I was up again at six. At seven we were in our place, coaling: and from that hour till nearly one a shoal of black boys swam in emerald green water round the ship like a flock of Highland seals, They sang and shouted and ate oranges and dived for coins. They chased each other, and sank and wrestled and turned heels over head, and generally, for good six hours, they swam about us in water at 88° with all the ease of amphibians. They are brown in the green water, and their heads are like brown mops. When we started, a cluster got hold of a rope alongside and were dragged. A sailor tried to haul in the rope and could not. He got a tin and splashed their faces; they showed their ivory and white eyeballs and yelled. He shied the tin at them; one caught it and waved defiance. He shied klinkers at them; they ducked, and he missed. Meantime, three little wretches in as many hollowed logs kept alongside with paddles, going as fast as we did, shouting. "Heave for a dive." Then our pace got too fast. Our rope of boys shed its black crop. They fell, and dived to clear the screw, and we left them in the green sea, swimming for their land-quarters, a mile away. These boys beat all the swimmers ever I saw or heard of. The Singapore boys were marvels, but these beat them. (A Briton has beat them all since).

I landed and looked at Aden rocks, ate a shore breakfast and came home in time. My wigs, isn't it hot! My plan is to rise about one and sit on deck for an hour, and drink lime-juice and water. Then go back to my bunk and sleep with my

head out of the port, or in it at least. At dawn I get into a bath at 85°, 86°, or 87°, fresh run in from the sea. It feels quite cool. Then I and everybody in the lightest costume consistent with conventional propriety loll about and smoke and drink tea, coffee, chocolate or water. At half-past nine we must dress properly and breakfast solidly, slowly, copiously, after the manner of the French. We have outworks (hors d'œuvres). followed by kitchen plates (plats de cuisine), and dessert, and cheese, and café de Mocha. I know that you like hints for house-keeping. But the "dunnage," which is a sailor's translation of "outworks," take such a time that I generally depart long before the end. If I get very hot, I go and sit in the bath, crowned with a wet sponge. Then I come here and work. At intervals we have tiffin and drink lemonade; at half-past five we dine. Then I go forward, sit in "the eves of her," among the sailors and the monkeys, take off my coat, and smoke happy and cool. At dark I go to bed, get my head out of my port, and sleep till one as before. We are a Noah's ark full of curious creatures, Japs, Chinese, Javanese, Eurasians, blacks, whites and browns. Jones and Robinson, are here, also priests, and nuns, and nondescripts, naughty boys, and squalling babies, and hobble-de-hoys, and "de hurls." I get jabbering to some of them, but we are like members of a large club, we do not fraternize as smaller lots do when first they go to sea. They almost always quarrel before they get to land, on long voyages. That, I hope, we shall avoid. Some have quarrelled with the cook about the dinner, of which some parts had a tropical taint. Not to put too fine a point on my pen, I might have hung my hat on the perfume of a beyy of roasted quails. The cook's

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peace-offering was a magnificent "rosbif," adorned with skewered prawns, and vegetable artificial roses. I hope that the peace is solid as the offering to John Bull. We have a Derby sweep on foot, and a champagne cocktail was going a while ago, meantime we are in that mysterious Red Sea, about which we read when we were not globe trotters, but toddlers, or squalling infants. Now I must get out of this nursery, into the north-east wind, which is pleasanter company than babes.

I don't know what I shall do. I shall post this in Egypt, and it may be that I shall go on with it to Marseilles. A poor sick man on board may put us all in quarantine. He looks terribly ill, and this Red Sea heat is desperate. We are right under the sun, between the sands of Arabia and Atrica. Were it not for the north-east wind, my best friend, I should be grilled; as it is, I stew. Being in this melting mood, I shall shut this, and possibly write another if I survive.

J. F. C.

Sunday, May, 30th.—At Suez, 9 A.M.

No. LIX. "Mei-Kong" Steamer, near Marseilles,

June 9th, 1875.

My Dear V..

It is absurd to write a letter and race it home, but that I am going to do. Which will arrive first remains to be seen. I wrote a lot of letters from Ceylon. I believe they are all on board. One is beside me, unsealed. The fact is, that I could not go to Bombay for letters only, and India was too hot for travelling. Just you picture to yourself getting into water at 88° 1 to cool yourself, and enjoying it as a cold

<sup>1</sup> My glass reads too high-8620.

bath. That was the state of matters at Aden. I have been roasted and stewed enough in Java and Ceylon, so I set off for London with my letters. I have little to tell. Our pastors and masters instructed us ill about the Red Sea. It is emeraldgreen in shallows, and blue as blue can be in the deeps. The hills are yellow or white. I pointed out these facts solemnly to an old French salt up in the bows one evening. He smole a smile, and said: "On l'appelle ainsi. La mer noir n'est pas noir non plus." I smoked, rebuked. But why they called this exceedingly blue water the Red Sea I have yet to find out. Our life on board is the usual thing. About four I get up and walk the deck in a Chinese blue silk coat, a red bonnet, and yellow Turkish slippers, with nothing besides. I believe that they call me St. Paul; I don't care. Then I drink lime-juice and water, and take another spell in bed till sunrise. Then I get into a hot sea-bath, fresh drawn, and refreshingly cool at 85° or thereabouts. By the time I get out, tea, coffee, and chocolate are on the table. There sit men in all the Eurasian fashions of the East, with bare feet in slippers of all forms. By nine we must clothe ourselves to eat at half-past. Then we smoke. At noon we have tiffin. At half-past five we dine. At eight comes tea; but I am out of my clothes by sunset. Now it so fell out that the odour of some of our dinner was so strong, that a rebellion grew out of it. Two deputations waited on the purser (commissaire); a third, composed of Dutch and English, followed, and found that officer furious and contradictory. "You are all sea-sick," he said, "and do not know what you want to eat. As for the meat being unfit to eat, that is impossible. It is not true." The deputation

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retired, and drew up a memorial, to be sent to the Times. "Give them a good rosbif," said a friend to the commissaire. A bullock died. At breakfast two waiters bore in a vast joint of beef, all skewered over with red prawns. It was carried all about and exhibited; but, so far as I know, it appeared as hash at dinner. We had no more perfumed viands except fish. I fell out of health one morning on getting into the cool weather at Suez. Everybody did. Those who had ague about them shivered and grilled in the usual way. It was 69° by the glass, but we felt as if it were freezing. I asked for a cup of soup, and could not get one. I pointed out to a waiter that I was ill, and needed "soins." "Si vous êtes malade, monsieur, soignez-vous," said he. I was too seedy and lazy to fight, so I took his advice, and went to sleep, starving. I got some broth from a stewardess and some chicken from the children about night, and recovered. Of all the sets of ill-conditioned beings that ever sailed at sea, I think bad French stewards are the worst that I have met. But then these poor wretches are so driven that six are in hospital and the rest in despair. It's all that commissaire. Like Ulysses, I have sailed through Charybdis, past Seylla. I asked a man to hold my leg if he saw me going overboard at the rock of the Sirens. He looked puzzled, and asked me if I felt suicidal after my feverish attack. I had to explain. "Is it in Télémaque?" said he. "No," said I; "in Homer." I have seen Stromboli; I have seen Vesuvius. We were all three smoking our several pipes. Yesterday morning I was at Naples. This morning I was at the north end of Corsica. To-night I hope to get to Marseilles, three weeks and one day from Galle. I shall VOL. II.

send off this letter any way. I may stop to get some clothes washed somewhere, but you had better get a lot of the clan to come and dine. Tell your mother to slay the fatted calf, if I have not done it by word of mouth, and so for the moment good-bye. I started July 6th, so I have been gone eleven months and a day. All I know about you all is that you were well on the 1st of April. I hope to find you with good appetites.

J. F. C.

No. LX.

LONDON, June, 1875.

MY DEAR ----

I am sorry to miss you. I got home on the 10th with a lot of very pleasant travelling friends whom I met on board the French mail, and travelled with through France, as fast as ever I could go, by rail. At Marseilles I met a very agreeable steward, who gave me coffee on board one of their well found ships out near Galle. He had fallen sick, and had turned waiter at the railway station. We fraternized like good republicans. At Paris we got the rough crust of railway dust off our faces. At Dover some of the party threw away cotton guilts that came from Cashmere. We paid large moneys to a loafer who had brought us bottled beer, and we were Britons on British soil once more in a railway train. Arrived in London, I went to my club, weighed, rejoiced, and called for a dram of coffee. I got that, and the usual two slices of brown bread and butter; and as I tasted the very same things, in the very same place, handed to me by the very same man, in the very same clothes, the last eleven months suddenly became as a dream. I looked into the readingnews look hear soun Ther of a with a yea at a been chile whit soon rade We and rank drea asto the I dcI an mix tress drea at .

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room, and saw the very same men reading the very same newspapers, in the same chairs, with the well-known home look of perfect quiet and repose on their familiar faces. I heard the click of billiard balls, and seemed to awake at the sound, just where I had gone to sleep in the travellers' library. There is a story which pervades the world in many shapes. of a man who went into a hill and met the fairies, and danced with them, and drank their mountain dew, and came out after a year and a day believing that he had been away for a night at a ball. Like that man I only began to realize that I had been away for the best part of a year, when I found little children grown big, little girls young women, grey beards white, and gaps at the gatherings of vagrants, that began as soon as I got home. I found that I, and many of my comrades, had been counted among the lost on board the Japan. We have cause to be thankful that we have got home safe and sound, and that gaps are so few when we close up our ranks for the battle of real life, and awake from our long dream in fairy-land. I go out in the world, and rub my astonished eyes when I look at my beautiful countrywomen, the most beautiful that I have seen by far, in their new attire. I don't recognise my best friends. I sometimes fancy that I am still dreaming with all the incongruity of a dream, mixing up dresses of the Antipodes with those of our ancestresses, and clothing my fair friends in beautiful new dreams. Conversations turn to revivalism, and I am back at Boston, and out in Oregon among mediums and lay I read of comfortable coffins; China and preachers. Ceylon rise before me with millions of unburied coffins, and brick grave-mounds scattered broadcast over the fields,

anywhere and everywhere, or placed by the road-side, on the only ground not devoted to making plantations for making money. People tell me that it is hot; I feel that it is not. I sit me down in my chair, and smoke where I have smoked before, and gradually fall asleep, and awake with a profound conviction that I must have dreamed all that I have written to you and others in these letters which have been copied. and which I have just read as if they had been written by somebody else. But there is all my stuff before my eyes home before me, ranged where I ranged the things when I bought them, and placed them in my mental models of houses at home, when I was over the way in Here are letters, journals, and sketches, beside Japan. real people and places, to prove that I really have been round the world since I saw you, and that I saw your fresh wheel tracks at my door, and missed you on the 10th of June by a day. That must be the very day which I lost out in the Pacific, down there & at the other side, under the soles of our boots. It was a sad loss when it made me miss vou.

I see nothing for it but to set off again, and travel the world widershins to unwind the thread of time, and come up again from "down there," to find myself in second childhood, all new babies unborn, and all their broud young mothers disengaged.

I hope to see you before I start again for "down there." **Meantime**, accept my blessing, circumperiambulatorically.

J. F. CIRCUMNAVIGATOR.

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THE PERIOD OF POLAR GLACIATION.

(Paper written on board the Great Republic steamship while crossing the Pacific in October, 1874.—Added to at Yokohama in November.— Revised and added to on board the  $Costa\ Rica$  steamship while crossing the Yellow Sea, January 28.—Re-written and re-arranged at Shanghai while waiting for the French mail Le Tigre, January 31, February 1, 2, 3.-Added to on board the Hydaspes P. and O. steamship in the China Sea, February 18.—Read and revised and added to after a trip through Java at Singapore, March 31.—Added to at Newera Ellia, Ceylon, April 14. —Added to at Colombo after travelling about 600 miles in Ceylon, May 14.—Fair copy made on board the French mail steamer Mei-Kong, May 18, 19, 20, 21, 22.—Finished for final revision May 22, near the longitude of Astrakhan, having travelled round the world westwards .- Added to in the Red Sea and Mediterranean, having joined my route in 1873 at Naples and at Marseilles. -Finished for revisal June 7.—Revised in London after reading up geological publications, July 2, and sent to press December 1, 1875.)

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"The Elements, Earth, Water, Ayre, and Fire
To rob each other daily doe conspire;
The fiery Sun from th' Ocean, and each River
Exhales their Waters, which they all deliver;
This water, into Clowdes the Ayre doth steale,
Where it doth unto Snow or Haile congeale,
Vntill at last Earth robs the Ayre againe
Of his stolne Treasure, Haile, Sleete, Snow or Raine,
Thus, be it hot or cold, or dry or wet,
These Thieves, from one another steale and get."

All the Works of John Taylor, the Water Poet,
p. 116, 1630.

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## PERIOD OF POLAR GLACIATION.

I.—INTRODUCTORY.

Able geologists make the "Glacial period" an astronomical question.

The Duke of Argyll, when president of the Geological Society of London, in his address, delivered February 20th, 1874, said:—"There is a region in which geology passes into cosmogony, and questions connected with the origin and history of our globe merge in the more general questions which arise on the history and condition of worlds around us.

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"Other sciences are coming into more intimate connection with our own, and are widening our horizon as to the causes and forces which are to be reckoned ordinary in the operations of nature. Our planet is only one of many, and our whole solar system is only one of many more."

That able address was delivered on the words of Mrs. Somerville—"How little it is that we do know!" The longer men live the more they feel what a great deal they have to learn in a very short time.

Mr. Evans, president of the Geological Society of London, in his address, delivered February 19th, 1875, while I was

steaming over the China Sea in the *Hydaspes*, said, in speaking of the Arctic Expedition then being organized:—"Should the discoveries of these successive floras with which we are already acquainted, and the existence of which it is so hard to reconcile with their present Arctic position, be extended into still higher latitudes, there will probably be a rude collision between existing astronomical theories as to the permanence of the position of the poles of our earth and stubborn geological facts." If the world is cooling, that may possibly account for the warm Arctic climate which has been proved geologically.

Mr. Evans added, "On this point, however, it may appear somewhat premature to speculate." It still is premature in July, 1875; but these two quotations suffice to show the present tendency of geological study.

Newton long ago surmised that all parts of the solar system are formed of the same materials, subject to the same physical laws; and that the sun, whose rays heat, is hot. The latest discoveries in solar physics show that the sun's atmosphere consists partly of light gases, greatly heated and incandescent, and of sublimed metals. These matters are driven outwards, form clouds, condense and fall. The sun appears to be made of matters known on earth, and to be a larger mass of them more heated. A solar "Glacial period" may be in the future, if the sun is cooling; but if the sun is cooling, and still is hot at the surface, a solar cold period is improbable in the past. If the sun's rays once had more power the world's climate would be warmer even in Arctic regions. So I suppose.

The moon reflects solar light, and a little heat, but radiates

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neither so as to be appreciable on earth. On the surface are no visible gases, clouds or fluids; all there appears to be solid and stationary. The forms of lunar mountains register old volcanic activity, fusion, motion, and far greater heat at the surface. A lunar "Glacial period" may be present, for the moon has certainly cooled; but forms there register greater heat at the moon's surface, not greater cold in the past.

A former period of cold in the solar system is improbable if the moon has been hotter outside.

The moon accompanies the earth; it is illuminated by the same rays, and externally is subject to nearly the same conditions of heat and cold.

The earth appears to have cooled at the surface, and to be hot within; the spherical shape of it indicates fusion. Some matters which are sublimed in the solar atmosphere, still are sublimed on earth in volcanic eruptions, and by heat in the arts. Gases, which are condensed and combined in fluids on earth, and which there freeze solid when sufficiently cooled, are driven far from the body of the sun by heat. Hydrogen, which is incandescent in the sun's atmosphere, becomes incandescent on earth when ice has been melted, and the vapour of water has been decomposed by sufficient heat. Extinct volcanoes, igneous and altered sedimentary rocks and fossils, prove that our world has been hotter at many places which now have cooled. The world still is hot enough beneath the surface to affect thermometers where the crust is pierced or broken: in mines, in hot springs, and in volcanoes. The moon has cooled. The earth, exposed to like external conditions, has cooled also at the surface. If the sun and the earth are hot, and are cooling, and the moon registers high temperature,

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an earthly "Glacial period" is improbable in the world's past. But one may have begun. We may see our past in the sun's present condition, our future in the moon.

Marine polar glaciation now reaches Lat. 37° N.; glaciers enter the sea about Lat. 60° N. One glacier is about Lat. 40° N., others are between 27° and 28° N., at 1,300 feet above the sea. An "ice-cap" may be growing, cold may be creeping inwards. But one, or many recurring "Glacial periods," and an old "ice-cap," need geological proof, because they are improbable, for these reasons.

If aerolites and the earth, and the moon and the sun which warms them all, are made of the same materials, subject to the same physical laws—if three be cooling in cold space; if two still are hot, and the smallest of three worlds has cooled outside to solidity—then it is improbable that the earth's surface ever has been colder generally than it now is.<sup>1</sup>

The Glucial Period.—Whether the so-called "Glacial period" be counted celestial or terrestrial, astronomical or geological, universal, general, or local, it certainly is meteorological. It is a question of climate, dependent upon the observation of facts for solution.

In travelling it is demonstrated practically that climates are greatly affected locally by ocean circulation. Cold climates follow polar waters towards the equator; warm climates follow warm equatorial streams towards the poles. In the northern hemisphere, in certain regions, glaciers now flow, and polish, score, and wear rocks under them. They carry stones and débris down hill, and out into flat grounds,

1 See Frost and Fire, 1865: "Upheaval."

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as far as they reach. They reach the sea about Lat. 60° N. in Greenland, and their broken ends with their loads of *débris* float away as "icebergs" till they capsize or melt.

Icebergs now reach Lat. 37° N. In many Northern lands where no glaciers now exist, and in plains where the sea bottom has become dry land, "ice-marks" and "glacial drift" occur abundantly. Various theories seek to account for these old marks of extensive glaciation. According to one theory existing causes suffice to account for them all. According to another, during a late exceptional, or recurring period of excessive cold, the northern hemisphere was almost, if not quite covered by an "ice-cap"-by glacier ice of vast thickness, which flowed southwards from the pole on all meridians, covering the land, and filling the bed of the sea. This "ice-cap" needs proof, because it does not now exist; I have shown that it is improbable. If it ever existed the marks of it ought to be found on all meridians alike. If ever there was a "Glacial period" on our world, glacial marks ought to be found everywhere in the same latitudes, and at the same levels, in the same state of preservation or nearly. The following pages contain chiefly facts, gathered during more than thirty years of observation of glacial marks in the northern hemisphere; followed by a journey round the world in 1874-75, during which attention was specially directed to this branch of geology.

By 1865 the author of this paper had reached the opinion expressed in the volumes called *Frost and Fire* (see Vol. II. p. 147).

In 1873, after travelling in Ireland alone, and with the directors of the Geological Survey and their able assistants,

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he got to think that the whole northern hemisphere may have been covered with ice when Ireland, Scotland, Scandinavia, and parts of North America were (see *Quarterly Journal of the Geological Society*, May, 1873). In 1874, after travelling round Europe, he saw reason to doubt that conclusion, and said so (op cit, November, 1874).

The geological question considered while travelling in 1874–75 may be thus stated:—

- 1. Do marks of ancient glacial action prove that the world's climate was colder?
- 2. In other words—Has the limit of freezing, which everywhere surrounds the world, in the atmosphere or underground, at various altitudes, which rises and falls with the seasons, and is raised or lowered locally where hot and cold waters flow, ever approached nearer to the earth's centre, so as to lower the limit of "perpetual snow" on high grounds, and to bring the isothermal curve of 32° at the sea level nearer to the equator everywhere, at the same time?

I will give my budget of facts and state my opinion in July, 1875, for what it is worth.

## H.--EUROPE FROM THE VOLGA TO THE ATLANTIC.

In a paper read before the Geological Society of London after travelling round Europe in 1873, I tried to show that marks of ancient local and of polar glaciation in Europe then known to me, can best be explained by ancient polar currents, like the Atlantic current which exists. According to glacial marks which I have seen and studied, Scandinavia and

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hills were covered by very thick glacier ice, which went far out to sea, in the latitudes of Greenland, as far south as 60°. To the east of Finland glacial drift of Northern origin is spread over the plains of Russia. That drift extends from the White Sea to Nijni Novgorod, and thence through Poland and Northern Germany, nearly to the mouth of the It is bounded by an irregular curve which extends from Nijni Novgorod south-westwards towards the British Isles. All Scotland is glaciated to the sea level at least. Scotch mountains certainly were covered by glaciers of large All Ireland is striated. The lowlands are thickly strewn with local and Northern drift. Erratics are perched on hills, conspicuous ice-marks enter the sea in the south of Ireland. All Wales and the hilly parts of England have clear marks of local, possibly of polar glaciation. Northern drift is close to London. "Perched blocks," great stones balanced on hill tops, abound even in Devonshire near Lat. 50°. "Erratics" have been fished out of the Channel in trawls. Marks of glaciers are in the Pyrenees about 4F. The facts prove that the limit of freezing has been lower over Europe generally. I had learned to believe in a late "Glacial period," I had begun to believe in an "ice-cap" and in a series of "Glacial periods" due to astronomical causes, when I set out to travel round Europe in 1873. When I came back I supposed that climate was different when the low grounds of Europe were last submerged; when the Arctic current flowed towards the equator out of the Arctic basin, to the east of Finland, where shells are found; and to the west

along the curve which Sir Roderick Murchison drew on his map of Russia as the "limit of Northern drift."

I suppose that existing causes produced like results of old. I suppose that cold sea waters bred glaciers on high grounds in Scandinavia, which then were as near to the polar stream as Greenland now is. The freezing limit now is lower in Greenland than elsewhere north of the line in the same latitudes. It is proved by clear marks that Scandinavian, Scotch, Irish, Welsh, English, and Alpine glaciers were far larger than any which now exist in Europe. That is one fact. The limit of freezing was lower over a large area. That probably was according to my explanation of the facts, when seas near these European highlands were chilled by polar waters cumbered with floating ice, drifting out of the Arctic basin over Russia and the plains of Western Europe, along the curve which now is marked by "Northern drift."

That theory was built of a large number of facts. I have coloured a map blue and red to show roughly where ice-marks are, and where they have not yet been found in Europe.

These marks certainly record a cold European period.

Of those who attribute the cold to a general "Glacial period" some attribute northern drift to the movement of solid polarice. From marks they infer the cap of ice and the cold, and they account for the cold astronomically. But I have shown that cold periods seem stronomically improbable.

It seemed to me that more facts might—lp me to form my own opinion. My method had been to follow ice-marks where they led.—If they led—a up the course of a stream to a hill
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a hill country they registered a local glacier. When marks had led me over hill and plain, from Cape Clear to the Baltic, and to the Polar Basin; and when drift had led me thence southwards; these facts led me to a larger conclusion. I had to deal with "polar glaciation" in Europe. I set out this time not to "track," but to "ring" this northern secret:—to try to find out polar glaciation by going round the pole, crossing the tracks of ice. I have arranged my new collection of facts in geographical order, as I gathered them in travelling from the Volga westwards.

If an ice-cap made these European marks, then marks like them ought to be found all the way round the world. With that idea I started from London, July 6th, 1874.

## HI.-THE ATLANTIC-EUROPE TO AMERICA.

OCEAN circulation greatly affects climates locally. It results from solar radiation. A given bulk of salt-water is lighter at 88 or at 60° than it is at 30° or 25°; consequently heavy water chilled near the poles displaces and flows under and lifts lighter water warmed near the Equator by the sun's vertical rays.

The Challenger soundings which have come to my knowledge confirm that which I showed in miniature ten years ago. Fluids unequally heated are unevenly weighted, and move accordingly. Recent deep sea observations have proved that water, which probably comes from Antarctic regions, underlies, at a temperature of 30° surface-water at 85°, at the

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orm des Equator in the Indian Ocean.<sup>1</sup> Ever since the sun warmed the sea it must have circulated in obedience to this law, though the direction of movement varied with the shape of land under water and above it for the time.

The longest clear water way from north to south now is the Atlantic. The widest passage into the Arctic Basin now is between Greenland and Scandinavia. The way is wide open southwards between Africa and America. Between Liverpool and Boston, U.S., two streams are crossed which flow in and out of the Arctic Basin through the passage between Greenland and Scandinavia. In shallow water, near the banks of Newfoundland, about 45° N. Lat., 50° W. Long., the Arctic and Equatorial currents of the Atlantic move opposite ways, at the surface, side by side, in narrow lanes. Clouds of mist condense above the cold water, and there rest in calms; drift ice is often hidden in these sea clouds. On the Cunard steamers the surface temperature is taken every four hours as a precaution against drift ice. A diagram (page 84, Journal) shows the temperature observed on board the Batavia when I crossed between the 9th and 18th of July, 1874. Red shows where the Equatorial streams passed northwards at a temperature rising to 68°; blue where the Arctic current passed southwards at a surface temperature of 50°. The cold waters flow south-westwards out of the Polar Basin, and are perceptible nearly to Florida along the American coast. They carry large icebergs, of which some few now reach Lat. 37° N. Of these many slide off Greenland and lands north of 60° in America as glaciers. They carry stones

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<sup>&</sup>lt;sup>1</sup> Captain St. John informed me of this at Kobe in January, 1875. He made the sounding in 1874 from his ship.

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to sea, and drop them where they capsize or melt. "Erratic stones," fragments of distant northern rocks, are carried to sea by glaciers from an area north of 60° larger than India; or they are picked up on the coast by sea ice north of 40°. They may be angular, or grooved and polished like stones about glaciers elsewhere, or they may be rolled beach stones. They may drop at last on any other kind of rock or in mud, or on any kind of marine drift, now gathering at the bottom. North of 37°, or thereby, modern erratics are strewn within the limits of drifting ice. They must therefore abound in the North Atlantic along the coasts of Greenland, Labrador, and Newfoundland; but few can reach or pass 37°. The present distribution of northern drift in the Atlantic is a true cause sufficient to account for erratics about the Caspian Sea and the Mediterranean in Europe; about Washington, St. Louis, Pike's Peak, and San Francisco in America; about Yokohama and Shanghai on the Asian coasts; or anywhere north of 37°:-supposing the place to have been submerged, and within the limit of drifting ice. Because of the present condition of Greenland, glaciers may have entered the sea anywhere north of 60° without a general glacial period. Because the sea now freezes at New York, ice may have scored rocks and moved stones anywhere north of 40°, under like conditions of local climate. Northern erratics may have been dropped from icebergs anywhere north of 37°; because icebergs now reach that limit in the Arctic waters of the Atlantic.

But if there has been a general period of cold, erratics ought to be found south of the present limit of 37°. I found none in Europe, so my opinion was changed in 1873. In papers printed during my absence, I find new proofs of

recent European submergence. In Scotland, in the north of Italy, and elsewhere, beds of Arctic and other shells have been found at spots widely separated. Taken with beachmarks and glacial marks these shells demonstrate submergence during that European "glacial period," which some writers suppose to have been general.

THE GULF STREAM.—In circulating, part of the ocean flows towards the N.E. from the region of the Gulf of Mexico, at a high surface temperature, cooling as it flows. Part of this warm stream sweeps round in mid-Atlantic, and passes Spain and Northern Africa. Part of it crosses the banks of Newfoundland, and passes Ireland, Scotland, Iceland, Scandinavia, and the North Cape of Europe. It reaches Spitzbergen, the Waranger, Fjord, and Novaya Zemlia. It carries certain large flat brown beans, seeds of Entada scandens. These grow in Java. They are found, or worn, or preserved as curiosities, in the Andaman Isles, in the Seychelles, at the Cape of Good Hope, in the West Indies and Florida, in the Azores, Ireland, Scotland, Iceland, Scandinavia, the Waranger Fjord, and Novaya Zemlia. lately found island was named "Castanji ö." The "Gulf Stream," therefore, is only part of a general system of oceanic circulation which affects climate locally. The warm surface water carries warmth and moisture with it, and greatly affects the climate of Western Europe. The limit of freezing is raised and lowered on opposite coasts. The isothermal curve of 32° is carried northwards to the North Cape, and southwards to Cape Farewell, at the sea-level.

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<sup>&</sup>lt;sup>1</sup> See Recherches récentes sur les Glaciers actuel et la Période glaciaire, par Charles Martine; Paris, 1875. Revue des Deux Mondes, 15 Avril, 1875.

The cold stream carries a cold climate, northern drift, and a northern Flora southwards, along the American coast; the warm water carries a warm climate and tropical seeds northwards in Europe.

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In the latitudes of Norway, where few glaciers exist, and, where one only enters the sea, Greenland is covered with ice, and large glaciers enter the sea in most of the large firths. In the latitude of Wales, the climate of Labrador is exceedingly severe, and the sea is cumbered with very large "islands of ice." On that shore Fauna and Flora are sub-Arctic. In the latitude of the Straits of Dover, the Straits of Belleisle are full of large stranded bergs and drifting "growlers" as big as ships. In the latitudes of Tiflis, Naples, Lisbon, &c., ships making for Boston and New York in winter get so loaded with ice near the shore, in the cold water, that they often return to thaw in "the Gulf Stream" which sweeps northwards outside. The limit of perpetual snow is lowered within the influence of the cold stream, and raised on the opposite coast by the warm water. In Greenland, glaciers enter the sea about latitude 60°. In Norway, at about 7,000 feet above the sea, Snæhättan has no glaciers, and little snow in summer. Mount Washington stands about latitude 40° 20' N. in America, opposite to the Pyrenees in Europe. It is but 6,000 feet high, yet wreaths of hard snow, which are locally styled glaciers, there outlast the heats of summer, and reach as low as 5,000 feet above the cold sea. I never saw summer show as 'ow on the Pyrences near the warm side & the Atlantic, but I saw snow on Corsica and Crete in June 1875, where the warm Atlantic stream does not affect climate locally.

On one side of the Atlantic a local glacial period now exists on land and at sea. The chilled heavy water, in flowing southwards from smaller to larger circles of latitude, lags behind the solid earth which revolves eastward at greater speed as the circles enlarge, and their degrees grow longer. The Polar water describes a south-westerly curve, hugs the American coast, carries drift ice, and stones which float on ice, and these stones drop and sink to the bottom, only within the curve described by chilled water at the surface. That curve of actual motion corresponds in direction to the curve which bounds old northern drift on shore in Europe.

But in consequence of the shape of land under water and above it, and of the present direction of Atlantic currents, no erratics now drop on the warm European side. No marine glacial action now goes on in the Atlantic to the eastward of the Arctic current. On the American side icebergs reach 37°. On the European side none reach 72°. In Western Europe on shore northern drift comes as far south as London, say 51°; but in Eastern Europe erratics are unknown outside of that old south-westerly curve, which corresponds to the actual curve of motion in cold Atlantic waters.

Old northern drift in Europe does not come quite so far south as modern drift ice does in the Atlantic.

The low grounds of Europe have been repeatedly sunk in many geological periods. Raised sea margins are on hill-sides in Scandinavia, and in the Caucasus, opposite to Finland beyond Russia. I suppose that old northern drift was dropped from drift ice when the low lands of Europe were last under a sea which obeyed laws which still govern ocean circulation in the Atlantic and elsewhere.

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I have coloured a map of the Atlantic blue and red, to show how the present limits of marine Polar glacial action in that part of the ocean correspond to the "limit of northern drift" on shore in Europe.

Looking to the Atlantic and its coasts, existing causes suffice to account for marks of glaciers which entered the sea north of 60°, for marks of coast-ice north of 40°, for erratics north of 37°. If the ice cap ever existed, marks of it ought be found in America to begin with.<sup>1</sup>

<sup>1</sup> An exceedingly neat series of small coloured maps of the northern hemisphere, constructed from Dove's monthly isotherms, gives in blue the shapes of figures drawn by circulating fluids upon the revolving sphere of the solid earth. I published samples of like figures drawn by fluids on revolving planes, in Frost and Fire, vol. ii. p. 450, &c. (Edinburgh: Edmonstone and Douglas, 1865). The shapes may here be expressed by a dot (a), an ellipse (0), and a comma (1). In September and October, the dot of blue, which means cold air circulating on the outside of a revolving world, begins to spread over the Arctic basin. In my experiments that was represented by a plane revolving eastwards, on which coloured fluids were dropped. In November the blue dot (a) becomes an ellipse (O), with the long axis towards Canada and Mongolia. In December the tail of the comma (,) grows down Europe. In January it is longest. In February, March, and April the blue tail shrinks. By May and June the irregular ellipse (0) has shrunk to theoretical regions, towards the unknown North Pole. In June, July, and August, the lightest blue on the maps, which means freezing-point at the sea-level, disappears. It thus appears that cold winter air obeys the laws which govern fluids when they sink down on a revolving surface. The Gulf Stream which is part of a heavier fluid circulating as the air does, is at the junction of the head and tail of the comma (1) near Novaya Zemlia. The weather, that subject of universal interest, depends on fixed laws. Weather forecasts have become probabilities in America. Ancient meteorology must also have been governed by the same laws. Blackstone says that "Law is the perfection of reason. What is not reason is not law." The trouble is that facts on which to reason about ancient weather are scarce and hard to gather. I have tried to use ice marks as registering thermometers from which to construct curves to represent local climates, and thus far my curves resemble those which result from Dove's monthly isotherms, which are founded on facts. The N.E. wind is a fact.

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## IV.—AMERICA—FROM THE ATLANTIC TO THE PACIFIC COAST.

IF an "ice-cap" ever existed, marks of it ought to be found on all meridians. In 1873 I travelled round Europe, and found no marks of Polar glaciation to the eastward or southward of a S.W. curve. In 1874 I set out to travel round the world, and in travelling to watch for ice marks everywhere. Between the Volga and the coast of America, I found in the Atlantic a cause acting, sufficient as I believe, to account for European marks of Polar glaciation. In North America I found in 1864 that the distribution of glacial drift on shore corresponds to the curve now described by the Arctic current at sea. In 1874 I found the same curve.

Lines of railway now cross to San Francisco, keeping to the north of the present limit of marine Polar drift 37° N.; San Francisco is in 37° 47′ 30″ N. In crossing the land some glacial marks are as easy to recognize as floating bergs are at sea.

Next to the Atlantic coast the land is a broad slope, rising gradually towards a coast range, of which the summit is Mount Washington, 6,000 feet high. As far south as the Potomae River, near the limit of 37° N., the Atlantic slope is strewn with northern drift, and the solid rocks are extensively glaciated most of the way to Washington. Behind the coast range, on which rolled drift occurs abundantly near the summit in passes, the Valley of the St. Lawrence, and the Hudson River Valley down to New York, are glaciated and strewn with erratics and drift. The Catskill Mountains, beside the Hudson River, are striated horizontally to a height

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d and itains, height of 1,800 feet, at least. The low grounds in these regions are thickly covered with boulder clay. Recent shells and bones of seals and whales indicate the presence of the sea, and a recent rise of land thereabouts. About Niagara and Buffalo rocks are polished and grooved, and the whole country is strewn with large erratics carried from regions far to the north. The direction of ice grooves generally is south-westward in this region. Northern erratics abound near the great American Lakes. In the valley of the Mississippi, about St. Louis, they reach nearly to Lat. 37° in the prairies. I saw none south of the Ohio. Many of these erratics are large, smooth polished, grooved, hard masses of gneiss, granite, and other such rocks, of which the nearest in situ are north of Lake Superior. So much I know from observation. Northward of the great lakes to Hudson's Bay, and to the Polar Basin, similar ice marks abound in low grounds in North America. That I know from reading and conversation. The distribution of northern drift may be expressed by a comma (•) whose head is the Polar basin.

Erratics and perched blocks and boulder clay, and all ice marks known to me, extend northwards in Labrador, as far as I travelled in 1864, towards Greenland. Erratics, very like rocks in Labrador, occur near Chicago; and thence to near St. Louis, southwards. I saw them in 1864. I saw them again after ten years at Chicago in 1874. I saw more of them occasionally in travelling westward to the Mississippi in August. North of the track they are numerous, and local geologists have traced them northwards to parent beds in Canada.

There has certainly been a great southerly movement of ice and stones overregions between the Atlantic and the Mississippi.

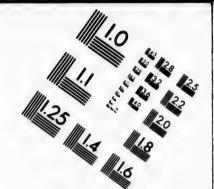


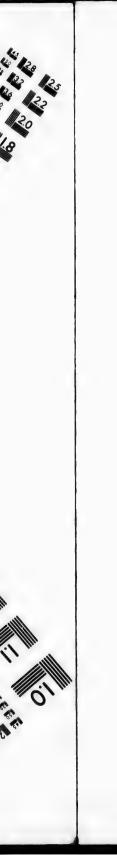
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There was a like movement between the Volga and the coast of Europe. But such a movement is now going on between Europe and America in the Atlantic, where polar glaciation is marine. These are the facts. Do all these marks on shore record a world's climate different from that which exists? or do they register something like the existing state of things?

If ever there was an ice-cap or a glacial period the marks ought to be generally distributed.

From the Mississippi to the Rocky Mountains the country is either "flat" or "rolling" prairie. The last is a plain more worn by rains and rivulets than the rest. The seeming plain is a gradual slope which rises to 6,000 feet at the base of the Rocky Mountains. The plains end with rolled drift at the level of the summit of the coast range, on which rolled drift is abundant. West of the Missouri there is no trace of glacial action near the railway. Along the course of the Platte River and as far as Cheyenne I saw no erratics, no large stones, no ice-ground rocks. From Cheyenne I followed the base of the Rocky Mountains southward to Colorado Springs, there I went up to the timber line on Pike's Peak to 12,000 feet above the sea. The snow was nearly 1,000 feet higher; that is to say, nearly 7,000 feet above snow on the coast range near the cold water. Near these snow patches, which outlast the summer, I found signs which may record the presence of local glaciers. Some agent has carried large blocks of granite from Pike's Peak to the plains, to 6,000 feet above the present sea level. The rocks above are rounded, but I found no striated rocks or foreign boulders about Pike's Peak. If these granite blocks were carried down by ice they were not carried out into the plains They stopped in glens.

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v record ed large 200 feet led, but Pike's ce they glens. If the erratics east of the Mississippi were transported by an ice-cap, or by a glacier as wide as the valley, the same marks ought to be found on both sides. I looked for a lateral moraine at the foot of the Rocky Mountains: I expected to find northern drift there. For a distance of 200 miles at least there is no sign of any sort of glaciation between hill and plain. Local American glaciers may have existed near the level and latitude of glaciers which do exist in the Caucasus: but there certainly is nothing about the base of the Caucasus or of the Rocky Mountains or between these two ranges to indicate the passage of an ice-cap over Europe and America, which covered the land and filled the bed of the sea. The figure described by northern drift in America is not a disc but a comma (9).

Having reached Colorado Springs and that conclusion, I supposed that northern drift was spread over these American plains to the limit of 37° N. on some few meridians only; not by an ice-cap during a glacial period, but when the low lands were last submerged so as to let an Arctic current flow from the Polar Basin between Greenland and the Rocky Mountains into the Gulf of Mexico. As cold vaters affect climate so this stream may have bred local glaciers, where snow wreaths still exist on Pike's Peak, which corresponds in latitude to Elburz in the Caucasus.

The American plains end at the semblance of an ancient coast. Their slope eastward is like that of the sea bottom off the eastern shore. The rocks of which the plains are made are little disturbed, and are nearly horizontal.

Fossils prove that the ocean covered the area in cretaceous times. East of the Rocky Mountains, so far I have explored

America, signs of Polar glaciation nowhere pass Lat. 37° N., and northern erratics extend so far south on a few meridians only. Facts gleaned between the Volga and the Rocky Mountains tell strongly against the ice-cap, and tell the same tale.<sup>1</sup>

#### V.-AMERICA-WEST OF THE ROCKY MOUNTAINS.

West of Cheyenne the Pacific Railroad ascends gradually to 8,000 feet, and crosses to California over minor ridges, with

<sup>1</sup> July 30, 1875. Dr. F. V. Hayden, U.S. Geologist, whom I met at Colorado Springs in August 1874, has been kind enough to send me Bulletin of the United States' Geological and Geographical Survey of the Territories, No. 4, second series, June 10, 1875. In this excellent paper is a panorama of the first range of the Rocky Mountains. It embraces about eighty miles, and was taken from a point in the plains nearly twenty miles from the range. It is a very good representation of forms which I saw, of which I copied some. In these drawings, as in nature, forms due to aqueous erosion are as manifest as they are in the Caucasus; and everywhere else on clay banks after rains. On the small scale of drawings this identity of form is more apparent. These granite hills, like road-sides, or like volcanic cones, have been furrowed by streams.

November 29, 1875. On the 16th I received from Dr. Hayden the Annual Geological and Geographical Report to Government for 1874, of explorations made in 1873, which embraced Colorado and regions west of Pike's Peak. Fig. 8 is a geological map of the Middle Park. Fig. 9 is a sketch map showing glacial moraines in the Valley of Grand River, near Grand Lake, Middle Park. About lat. 40° 15′ N., long. 105° 45′ W., large moraines occur in the vicinity of lakes which are supposed to occupy basins. Fig. 8 shows clearly by the absence of moraines and lakes elsewhere in the region, that these marks can only record the movements of large local glaciers in America, near high peaks; near the latitude of Caucasian glaciers which still exist. The absence of Boulder Clay about these exceptional moraines in a cañon country suggests further examination. Erosion by floods must have been followed by transport and deposition of masses proportioned to the masses removed. The Report is an admirable work. It seems to demonstrate that no ice-cap has passed over this region since the masses of the Rocky Mountains were first upheaved.

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plains between. I watched while I could see, and noticed nothing glacial, local or polar, till near the western coast. Near Lake Tahoe, and a cluster of lakes in rock basins, and at "Summit" in the Sierra Nevada; near snow-wreaths in August, at 6,000 to 8,000 feet above the sea, I found fresh tracks of large local glaciers, which once flowed a long way down-hill towards the Pacific coast, and inland. They were not larger than glaciers which now exist in far lower latitudes in Asia.

Very few boulders reached the next plain, where the Sacramento and other large rivers flow. I could not find one large specimen of granite from the Sierra Nevada in the plains of California, or perched on the coast range near San Francisco. I could not find any northern drift at all on the Pacific slopes, or about the Yosemite Valley, or anywhere near Lat. 37°. I went northwards about 1,000 miles to the latitude of Devonshire, and found in the streets of Victoria the familiar shapes of ice-ground rocks, with striæ aiming north and south. These rocks underlie northern drift, which extends through Washington Territory to the Columbia River and Oregon. That drift I believe to be of marine origin.

I had learned from inspection of the country between the Caspian and the Pacific in 1873 and 1874 that northern drift and signs of polar glaciation in these lands and latitudes, are locally distributed; and do not extend southwards from the Pole on all meridians. Their distribution in Europe and in North America can best be explained by ocean circulation, like that of the Atlantic. Curves like commas (•) represent polar glaciation in Europe and in America, and in the Atlantic.

It seemed probable that local ice systems, like those of

Greenland and North America, have been moved to and from spots on the northern hemisphere, together with cold polar streams, which were diverted by the upheaval and depression of land.

### VI.-AMERICA-RISE OF LAND.

THAT land in America has been disturbed, submerged and raised above the sea level repeatedly, is proved by fossils. The rocks in Labrador are greatly disturbed and altered, and are traversed by a confused network of dykes and bosses of granite, and other igneous rocks. Nevertheless, Laurentian fossils prove that some of them are true sedimentary beds deposited at the bottom of an ancient sea. Rocks of the coal formation in Nova Scotia and in New Brunswick prove that land there rose on which forests grew, and sank repeatedly to regions where fish swam. About the White Mountains rocks, said to be of Devonian age, are shattered and altered, and beds are tilted up on edge which once were horizontal. They continue to be horizontal westward in the Further south, about Pittsburg, coal-bearing rocks plains. are crumpled, folded, and faulted; but to the west of the east coast range, these beds are little disturbed. In Kansas flat cretaceous beds are worn and weathered so that fish and reptiles, and large shells peer out of their ancient graves to proclaim that the chalk ocean was there. Further north, in Iowa, cretaceous rocks, coal measures, Devonian and Silurian rocks, layer over layer, succeed each other in their order, according to the report of the State geologist. That indicates long submergence. Still later rocks and fossils prove that still later in Io supp the l

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long later seas have covered these Indian hunting grounds. Drift abounds in Iowa. Dr. White reports that it is of glacial origin. I suppose that it records the passage of the Arctic current of the last sea from which these American plains rose. It is part of the tail of a comma (9) whose head is the Arctic basin.

The whole shape and appearance of the country suggests a raised sea bottom. When nearing the Rocky Mountains the range is like a distant coast. The cliff and talus of the sea margin divide sandy plain from weathered rocks. The sedimentary beds which are flat in the plains, and in detached hills which stud them like islands, are raised at the edge, and lean against granite. At Colorado Springs the lowest bed looks burnt where it joins the granite. "he lowest disturbed beds are said to be "Permian." If so then the rise of the first range of the Rocky Mountains is later than Permian times, and may be much later. At the level of the plains the forms of weathered rocks are those of rocks which sea waves are now wearing into needles, stacks, mushrooms, and beaches all round the world. Their level corresponds nearly to that of terraced rolled drift on the White and Green Mountains on the east side of the plains. Everything about the east side of America suggests a recent elevation of the land: fossils prove ancient submergence.

Soon after leaving Cheyenne the railway leaves the plains and crosses the highest point on the line at Sherman, 8242 feet. It there passes over an anteclinal axis. We passed a series of four beds dipping eastward, one White Sandstone, two Red, three Limestone, four Altered Rocks, then weathered Granite. Then the same series dipping westward, one Altered Rock, two Limestone, three Red Sandstone, four

white. The "Black hills" seemed to be an outburst of granite of the same age as the granite of Pike's Peak with the same beds, disturbed on both sides and with the same strike. On the west side we came down to "Laramie Plains," and to red and white rocks between hill and plain worn into the same fantastic shapes as the red and white rocks at Colorado Springs.

It seemed to me that we had got to the other side of an old island, and to the ancient sea coast. Thence, to the region of Salt Lake, we passed a continual recurrence of plains ending abruptly at cliffs and at the semblance of a coast line. Taking the run of rivers as a guide, the first, Eastern, range of the Rocky Mountains, makes a lofty granite island in the midst of sandy plains, in which the older rocks contain fossil fish, shells and reptiles, and beds of coal; and are little disturbed. This coal region is said to be of miocene age. If so the land was under water in miocene times, for some beds are full of fish.

About Salt Lake, according to a local authority, the rocks are of lower carboniferous age. They are violently contorted. Amongst them are the same red and white sandstones, worn into the same fantastic shapes, at about the same level as the rocks at Colorado Springs, which there seemed to mark a sea margin at 6,000 feet above the present sea level.

Salt Lake is a deep basin, surrounded by terraces which mark ancient water levels. Above these the rocks are furrowed by mountain streams and cañons. There was no sign of glaciation about the lake. It has no outlet. In many ways it resembles the Caspian in miniature. The surrounding mountains are shaped like the Caucasus, and are equally water-worn.

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No living creatures inhabit the bitter waters of the lake which are fed by fresh streams full of trout. wastes only by excessive evaporation. There is no iodine in the water. Salt Lake is a puzzle to local authorities. I believe it to be a remnant of the sea from which America last rose. Hot springs occur, and the hollow may be volcanic; it certainly is not glacial so far as I can judge.

From Salt Lake westwards the same general forms prevail. Wide salt plains end abruptly at the terraced base of weathered sierras; "The Humboldt Valley" reminded me of the Rhine valley above Bingen. But right and left of this wide plain in which a slender stream meanders, wide dry flats open to the horizon. All the hills rise up weathered like the Greek islands, in a yellow sea of sand and sage brush. The hills have weathered water-worn tops and sides, cliffs at points, terraces, and a long talus which slopes to the sandy plain. Shells only can prove whether these plains were levelled at the bottom of fresh or of salt water; the whole shape of the country suggests the action of water in late times.

In this strange dry region rivers meet to form lakes, and "sinks" which have no apparent outlet. The rocks of which hills are made are greatly disturbed, and vary in composition, position and age, but they are chiefly sedimentary rocks, which were formed under water, and once were as flat as the plains. They have been raised by geological disturbance, but since then they have all been worn to the same pattern by streams, which have scarce furrowed the plains. This region has been repeatedly sunk and raised. Since it last rose it has not been worn by local glaciers, or by the passage of the ice-cap. There is no sign of polar or local glaciation

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The l are about it. The last signs of Polar glaciation near the Railway were seen about Chicago, in the plains.

Near the end of the Humboldt valley are beds of lava and volcanic hills. Throughout the region of disturbance hot springs prove volcanic activity. Metallic veins and dykes of igneous rock occur amongst fractured beds where they have been much disturbed, and chiefly near granitz ridges.

The last gradient on the Pacific Railroad is over the Sierra Nevada, and over an anteclinal axis.

Sedimentary rocks on the east slope dip eastwards; granite and syenite are in the midst; on the western Californian side the foot hills are sedimentary beds greatly folded, and locally much altered with a northerly strike. They are said to be of Jurassic age, but some are more like the hard Silurian rocks of Scotland. In these rocks occur quartz lodes, and their débris in rivers contains gold.

Recent sea shells occur in the Californian plains. The Pacific Coast range is one more series of beds greatly disturbed, with a northerly strike. The land has been raised from the sea in recent geological times, and it still is shaken by earthquakes. Indian traditions tell of violent alterations in the level of sea and land; sea shells in the plains prove that a late movement was upward.

The geological survey of California came to an untimely end, but cretaceous rocks with coal of that age were identified in the Pacific Coast range.

The Pacific coast, according to marine surveyors, is much terraced. A series of twelve horizontal shelves are cut in strata which dip various ways at one point. Elsewhere three or four shelves can be recognized. No large stones of

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much cut in where nes of northern origin have been found on them south of Columbia River. Nevertheless these  $\bot$  shelves, which I suppose to be sea margins raised from the warm sea in which the shells lived, have been attributed to the action of a Potar glacier, which filled the bed of the Pacific, and rose to the level of the highest terrace on the American shore.

Throughout the journey from east to west the road crosses the strike of rocks in North America. Throughout it the appearance of the country suggests a recent elevation from the sea or the drying of lakes. It is demonstrated by fossils and by the position of beds disturbed and undisturbed that the region which now is North American dry land has been repeatedly sunk and raised. I suppose that the deposition of Polar glacial drift in the Mississippi region took place during the last marine submergence, I estimate the rise of land at the base of the Rocky Mountains at about 6,000 feet. Because I found no erratics west of the Mississippi, I suppose that lands in these regions were out of the course of marine Polar drift, or were above water when stones were carried to latitude 37° near St. Louis.

There is proof in American geology of rise and depression of the earth's surface amply sufficient to deflect ocean currents, alter local climates, and displace local ice systems equal in area to those which exist in the northern hemisphere.

Existing causes account for all the glacial phenomena that I have observed thus far, if marks of Polar glaciation in Europe and in North America are of marine origin.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> November 30. The Government Geological Report for 1874, above mentioned, shows by diagrams how rocks in these mountain ranges bent and folded till the lowest of a series sometimes became the highest. To that Report I refer geologists, as to a reliable authority.

# VIL-AMERICAN GLACIERS.

A GLACIER may now form in any latitude if there be land there high enough to reach the limit of freezing, and if there be sufficient moisture in the air to furnish materials. One small glacier exists about latitude 36° in America. Another is said to exist about the same latitude on Mount Ararat. Much larger glaciers exist in the north of India between 27° and 28° N. at a level of 13,000 feet. It follows that marks of local glaciers north of 27° do not prove a general glacial period. They do but prove a local climate.

The present state of matters glacial on the American Pacific coast is shortly this:—From about the latitude of Gibraltar, in Europe, northwards to Sitka, a few glaciers exist on high grounds. In the south they are small, and far apart. In Alaska, from the latitude of London to that of the Shetland Isles, glaciers abound on mountains near the coast. Further north, towards Behring's Straits, no glaciers have been described. The country there is low, and like Russia, and most of the carrying work of ice is done in rivers in spring.

A local geologist lately described a glacier in the Sierra Nevada, south of latitude 37° in California. I did not see it. In that region I could hardly see a patch of snow on the highest mountains visible from high points near the Yosemite Valley. These "glaciers" are said to lie in deep gulches, and to have the motion of glaciers elsewhere; they are small, and confined to small areas. From description, I suppose them to be large snow drifts in a warm, dry region. An English party travelled 500 miles about the mountains east

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of the Yosemite Valley in August, 1874. They saw many patches of old snow, and encountered a heavy storm of thunder and snow, but they saw no glaciers, and heard of none. The snowfall is considerable in winter. It supplies the waterfalls of the Yosemite, irrigates the Californian plains, and washes gold for the diggers. A little further north, about Summit, I found considerable snow-patches at 6,000 to 8,000 feet above the sea-one, near Lake Tahoe, seemed to be hard ice. Thereabouts the road is covered for many miles by snow-sheds, and the trains are often blocked by deep snow in winter. Near the track are lakes, great and small, in true rock basins, and lakes behind ancient moraines. The rocks are all rounded, and fresh strige occur. Perched blocks and other glacial marks are about Lake Tahoe. A slight change of climate would soon convert these snow patches into local glaciers about Summit and Lake Tahoe. A slight change of climate probably destroyed the local glaciers of which I found the marks there.

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Mount Shasta is a volcanic cone in the Californian Coast range. It stands about the latitude of Oporto, and Constantinople. I have photographs of the glacier which there ends at 9000 feet above the sea, on the N. E. slope of Shasta Bute. I saw the edge of it from below. The glacier is small. In the end of September, 1874, the north, west and south sides of the cone were so clear of snow, that bare ground reached the top between the patches. In 1873-4 Constantinople, at the sea level, was blocked up with snow; and wolves were driven in from the plains, to feed on town refuse. The Shasta glacier therefore is comparable to small glaciers on Mount Ararat, and in the western Caucasus.

Mount Hood in Oregon is said to be 17,000, otherwise 11,000 feet high. It stands about the latitude of Geneva. With a good telescope I clearly saw the riven forms of névé, or of glaciers, or of lava, beneath new snow on the west side of the cone. I believe that I saw a glacier, but I am not sure. None of these riven masses reached the timber line. That line, on the cone of Mount Hood, is higher than the highest parts of the Cascade range. The glacier region then ends above the general level of the hills. So far as I know, a few small glaciers only are perched on isolated volcanic cones south of Columbia River.

Mount Rainier in Washington Territory is at the end of Puget Sound, about the latitude of parts of the Alps. It is a cone about as high as Mount Hood. On the west slopes I saw larger masses of riven snow, or glaciers, or the shape of a recent lava flood under snow which came down nearly to the timber line. That line still rose on a cone far above the forest which covered all the lower hills in the range. I could find no one who knew the facts, but I suppose that no glaciers exist in the Cascade range, except on tall volcanoes—I think I saw glaciers on them, but I am not sure.

Mount Baker so far as I could make out for mist and distance was like the other snowy volcanic cones of the region. It stands about the latitude of Devonshire, opposite to Vancouver's Island, which was my northern limit of travel.

According to Mr. Dall<sup>1</sup> the first large glacier in Alaska is in 57° 0′ 6″ N. about the latitude of the Isle of Skye. Marks of ancient glaciers abound near the Culin Hills in Skye, and

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<sup>&</sup>lt;sup>1</sup> Alaska and its Resources, by Mr. William H. Dall. Boston: Lee and Shepard.

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there tall volcanic cones once stood, according to Mr. Judd, who writes of the secondary rocks of Scotland.

Mount St. Elias is 16,000 feet high, in Lat. 59° 33' N. Long. 139° 42' W. It is about the latitude of Cape Farewell in Greenland where large glaciers exist, and of Southern Norway where old ice marks abound. An American traveller who had been several times to Alaska told me that glaciers slide off Mount St. Elias into the sea. The coast climate corresponds to that of Bergen on the corresponding Atlantic coast, where glaciers reach nearly to the sea. The following are means at Sitka for 14 years-1849-1862, Winter, 31°9; Summer, 54° 3; mean temperature, 42° 8 (Fahrenheit); rainy days 245. Annual rainfall, 83.33 inches. I could hear of no glaciers north or east of Alaska. The present state of the Pacific coast of America closely resembles that of the Atlantic coast of Europe north of 37°. Where the mountains are high enough there, a few glaciers exist near the coast, where the rainfall is considerable. They get down lower in the north and enter the sea about 60°.

The next question is—What has been the condition of the Pacific coast as shown by old ice marks?

Has the limit of freezing been lowered? Have glaciers entered the sea in lower latitudes? Has an ice-cap swept southwards over the whole land, scoring it from north to south?

## VIII.—AMERICAN ICE MARKS.

The Cascade range is attributed by American geologists to a rise in cretaceous times. In the Aleutian Islands still later tertiary beds lie horizontally on the flanks of volcanoes, and contain abundantly fossil shells of living species. According to Mr. Dall and his authorities, the coasts of America and Asia are rising. If so, Behring's Sea may dry and the continents join north of Lat. 50°, opposite to Atlantic shoals between Europe and America.

Professor Agassiz found marks near the Equator which led him to believe that the Valley of the Amazon was filled by a great glacier. From these and other marks he inferred the ice-cap and the glacial period.

Mr. Belt found marks of local glaciers on mountains in Central America.

A local geologist has found marks which indicate the presence of a large glacier in the Yosemite Valley, south of 37°. I sought carefully and found no marks of glaciation there.

About the same latitude on the other side of the Rocky Mountains, I found marks of local glaciers about Pike's Peak.

Dr. Hayden, U.S. Geologist, whom I met there, told me that glacial marks abound to the west in the neighbourhood of certain lakes which are marked on the survey map about Lat. 37°.

There seems to be evidence enough to prove that glaciers existed in the Rocky Mountains, that land was raised or the limit of freezing lowered, or that the climate was somehow colder locally than it now is.

I found clear marks of glaciers at Summit in the Sierra Nevada, a little north of 37°. Mr. Dall says glaciers were larger of old on the coast of Alaska. Such old marks are commonly explained by an astronomical glacial period. I supp by tl As

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suppose that some of them may be accounted for geologically by the rise of land.

As the region between Behring's Straits and Alaska has in fact risen, that water way into the Arctic basin has been blocked, and that change is sufficient to account for a considerable change in climate on the Pacific coast.

If, as I suppose, the eastern plains of America have risen, then the way into the Arctic basin has been further blocked on the eastern side of the Rocky Mountains. That change would further affect climate by altering the flow of cold water. The Arctic stream of the Atlantic may have reached lower latitudes, and may have bred local glaciers further south. But I could find no marks of Polar glaciation or of larger glaciers in the Yosemite Valley; none in the plains of California, even below the lake district; none near Shasta Bute, or Mount Hood or Mount Rainier, where I thought I saw glaciers.

If the American geological dates are right, there has been no general glacial period on the Pacific coast of America since the volcanoes of Cascade range boiled up in early cretaceous times. If these lofty volcanic cones were swept away there would be no glaciers on the Pacific coast now, further south than the Bergen Glaciers on the Atlantic, except that Californian glacier which I did not see. So far as I can judge, the present state of matters glacial on the Pacific coast and in the Rocky Mountains is near the maximum there indicated by old ice marks and new snow. No glacial mark that I know extends from the mountains into the plains in California or in Colorado; in Oregon or Iowa. I

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Sierra were ks are od. I saw no trace of Polar glaciation between the Mississippi and the mouth of the Columbia River.

I suppose that glaciers exist and have existed in various regions of the northern hemisphere chiefly because of local climate: because of the elevation of land, and the consequent direction of ocean circulation for the time; not because of the earth's position with reference to the sun, or the sun's position with reference to other stars in space.

I ceased to believe in an ice-cap when I had crossed America.

My faith even in a "general Glacial period" was rudely shaken in the Pacific, while stringing my facts together after travelling half round the world.

Now let me try to test the Glacial period by considering the largest marks, which I have yet attributed to glacial action.

## IX.—DENUDATION BY ICE, FIRTHS, ETC.

I WILL not stop to argue that glaciers wear rocks under them. The majority of geologists know the fact: the minority would not accept my authority. Glaciers do wear rocks, and mark them. They would wear them more in more time.

In all countries where glaciers abound or have abounded, deep, rounded grooves furrow hill-sides, and these hold firths when they reach the sea-level. In Norway, in Greenland, and in Alaska firths abound. But south of glaciated latitudes firths, bays, and islands are rare on sea coasts. I believe that firths commonly are large marks of glacial erosion. The Black Sea near the Caucasus is devoid of good harbours. Of

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glacial erosion even by large local glaciers I could find no trace there, or on the Pacific coast in California, Oregon, or Washington Territory. South of 48° N. latitude in America there are no firths, and few harbours of any kind exist south of Puget Sound. Professor Whitney, the Californian State Geologist, reported that "no northern drift exists in California." Mr. Dall quotes Whitney: "There is nothing anywhere in California which indicates a general glacial epoch during which ice covered the whole country and moved bodies of detritus over the surface, independently of its present configuration, as is seen throughout the Eastern States." Mr. Dall, whose own explorations were chiefly made on the banks of the Yukon River, about the latitudes of Iceland near the Arctic circle, adds:-" The same is eminently true so far as we know of Alaska." The same is equally true so far as I have gone between the White Sea and the Caspian, the Mediterranean and Atlantic in Europe, and Asia; between Hamilton Inlet in Labrador and the Potomac; at St. Louis, Colorado, and Cheyenne; between the Yosemite Valley in California, and Victoria in Vancouver's Island. Glacial denudation in all these regions. Firths, lakes, and small marks indicate local glaciers, not a general movement from north to south of solid Polar ice.

That which I have seen shows that something like the existing state of things has long continued on this earth; that gradual cooling of the whole mass has not been interrupted by a late period of intense cold, but that cold sea currents and their climates have produced the same results in different regions which they now produce in Greenland, in Alaska, and wherever they flow. They lower the snow plane.

Firths prove that no ice-cap has passed southwards over lands where deep rock-grooves radiate to all points. The largest ice marks disprove the glacial period. That period must have bred large glaciers where small glaciers exist. But no firths are opposite to the small glaciers of the Sierra-Nevada.

## X.-THE WORK OF STREAMS.

"Denudation," in geological terms, means wearing of the Earth's surface to an amount equal to all beds of sediment.

Every agent that wears rock leaves a different mark. A glaciated valley has a rounded section —; a stream cuts a V or Y. The action of a stream is slow, and the passage of Polar ice would efface marks made by streams. Where marks of aqueous erosion are large and old they disprove glacial action. The waves of the sea hack at the base of a mountain and so carve out cliffs, and plane off the mass which glaciers and streams carve and furrow. In sailing along any mountainous coast these valley sections are conspicuous. In Scotland and Scandinavia, which are glaciated, the mouths of glens and dales are rounded —. In the Black Sea, Caucasian valleys are all V-shaped. In the Mediterranean, along the Pacific coast of California, in the islands of Japan, and along the coast of China, Java, &c., all the valleys are V-shaped where the land is not glaciated.

The rocks of America, like all others, are much weathered and worn by running water.

The State Geologist of Iowa reports of that region, between

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the Mississippi and Missouri, that "all the irregularities of the surface are due almost entirely to erosion by streams."

The same author sets forth evidence of the glacial origin of drift in Iowa. The depth of furrows cut by streams is a measure of time elapsed since the glacial drift was spread on these plains, which I crossed in August 1874 between 41° and 42° N. latitude. I watched the plains carefully between Chicago and the Rocky Mountains, and came independently to the conclusion that most of the small irregularities of surface south of Lat. 42° are due to erosion by streams, not to glacial denudation. Whatever may have caused the depression of the beds of the great American lakes which end at Chicago, all these lakes have shrunk in their beds in consequence of erosion by streams which flow out of them. I believe that many like them have been drained dry by the same process.

River Marks.—The great western rivers all flow between bluffs, in alluvial plains, which are in constant motion. The waters are thick with sediment which the rivers wash from the land, deposit and remove, and roll seawards. All their feeders are like the great rivers. Every streamlet that crosses the railway track leaves a mark which is a copy in miniature of the greatest western river "valleys." Since the land was last raised above water, each stream has dug a trench through the plain proportioned to its size.

The St. Lawrence Valley contains recent shells and other marine fossils and drift. The river has dug a bed like the rest of its kind, proportioned to its size and age. It begun to dig after the land rose from the sea.

At Hamilton, at the further end of Lake Ontario, is a long,

even slope on which land streams have made little impression. It is bounded by a cliff or high bank about a mile from the lake shore. The high bank is the edge of a higher tract of country in which land streams have made considerable furrows. Beach and bank mark old lake limits, and measure the fall in the surface, which corresponds to the depth of the trench dug by the St. Lawrence at the other end. That part of the great river is not so old as the Niagara River. That stream has cut a trench at Buffalo. There Lake Erie is surrounded by a shelving plain which would be submerged if the channel at Buffalo were filled.

Niagara Falls have dug a cañon, a trench between bluffs, from the cliff banks of Lake Ontario back to Niagara, and that cañon is working up stream. So far as my eye could measure it, the "horseshoe" at Niagara has gone back a long way since I saw it ten years ago. When the deep drain gets to Lake Erie it will dry, and the river will begin to dig in a plain which now is covered with water. The old lake shores will suffer the fate of the shores of Ontario.

At Detroit the river has dug a third trench which has lowered the level of Lakes Huron, Michigan and Superior. Old water levels are conspicuous on the shores of Lake Superior. Some of these are at considerable heights, and may turn out to be raised sea margins.

About Chicago at the southern end of this great system of lakes and rivers the ancient lake bottom extends far inland. That shelving plain is bounded by low broad smooth terraces which are old lake shores. They are miles apart, but their height is small. The water tower at Chicago is higher than any point between the lakes and the Missis-

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sippi. The drain at Detroit accounts for the fall of surface at Chicago. The shrinking of all these lakes is in consequence of erosion by streams. That "prairie" which was last submerged is smooth and devoid of forest within the old lake bounds. The higher "rolling prairie" has been longer out of water; it is wooded, and it is furrowed by streams and washed by rains. There is nothing in the direction taken by streams in these regions to indicate the previous movement of heavy ice from north to south. The wide hollow between Hudson's Bay and the Gulf of Mexico is the only meridional groove in eastern North America that could be attributed to erosion by Polar ice. As the State Geologist reported, all the irregularities of the surface are due almost entirely to "erosion by streams" which flow all ways. At the Mississippi or Missouri or any big plain river which has done work proportioned to its size and age, "bluffs" give a section of the plain country and measure the work, The action of running water is as manifest on the American plains as it is on a plain of sea sand newly ebbed dry, and freshly worn between tides by land waters.

Within the ancient bounds of the great lakes American geologists have found the skeletons of creatures mired in bogs; elephants, rhinoceroses, two-toed and thrice-toed horses and apes. They have found beds of leaves, and conclude from flora and fauna that the climate was not colder, but warmer when existing lakes were larger, and when large lakes existed which now are drained by the erosion of streams. But glaciated boulders of northern origin abound in drift under the lake deposits; and under that drift are rocks of cretaceous age with marine fossils in them which indicate warm water.

The section is seen in the bluffs. We get this series about Lat. 40°, 42°, near Chicago: 1st. The existing state of things. 2nd. Higher lake levels and warmer climate. 3rd. Drift composed chiefly of rolled stones of northern origin, with a few large glaciated erratics in some regions only. 4th. Cretaceous and later rocks little disturbed with fossils, which lived in a warm shallow sea. All these reach far and wide in a country which looks as flat as the sea. As I read this record now, it means not the interpolation of a glacial period, but that these plains rose out of a sea like the Atlantic, during a period which was at least as warm as the present time. I hold that an Arctic current carried glacial drift south to Lat. 37° while the land was last submerged.

I see no place for a glacial period in this series which includes marks of Polar glaciation. I could find no sign of glaciation of any kind west of the Missouri, no moraine at the Rocky Mountains. Polar glaciation in the plains was local. All the irregularities of that wide surface are due, not to northern glaciation, but almost solely to "late erosion by streams." Their work is insignificant when contrasted with older mountain work done by them nearer to their sources where they have been longer at work if these plains have risen from the sea.

Cañons.—A cañon is a deep drain cut by running water. Arrived at the Rocky Mountains after crossing the plains, forms indicate long-continued uninterrupted "erosion by streams." The rivers which flow over the plains on wide beds, like those which land streams make on a sea strand, come out of deep cañons. Their dimensions are proportioned to the size of the streams and to their age, but all are of one

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pattern. Miniature cañons are seen in every clay bank and hill-side. Niagara is a cañon. In the Rocky Mountains, as in the Caucasus, hollows of the same pattern abound of every size and in every material up to granite in the Yosemite Valley, and the Grand Cañon of the Colorado. At the end of deep cañons, about Colorado Springs, the river delta, made of great rolled stones, spreads on the plain like an open fan. It is not a moraine, for the stones are not glaciated. The sides of the narrow granite gorge are steep as walls, 600 or 700 feet high, and the cañon ends at a fall, which is working slowly back into the granite mountain. The cañon is a couple of miles long, and drains a "corrie," Y.

In the region about Carson City, the capital of Nevada, the land is dust in summer, and the rivers commonly end in "sinks," where they evaporate. Paints, ink, gum-water, and the skin dry up. The country, like those who travel through it, is parched by excessive evaporation. No shower of rain had fallen there between May and September, 1874, save one thunder plump. But that shower proved the eroding power of streams. The rain fell on a steep hill-side, The water guttered from all rills into one Y-shaped cañon, where a tiny rivulet usually trickles over a yellow A farmer had built his ranch in the plain near the stream for irrigation. There the flood shot out of the cañon. In a few hours the farm was buried under stones of a ton weight, under gravel, logs, earth, trees, sand, and rubbish enough to make a new farm half a mile square. One house was swept away; another, built of wood, was turned round; the roads were destroyed, and then all returned to the former state of cloudless serenity, and dried up. But the fan of stuff which buried the ranch remains there to show what erosion by streams really is, and how water digs canons in these dry mountains.

As is the canon at Niagara, so are the beds of rivers generally in the highlands of the Rocky Mountains. Green River flows over horizontal beds which American geologists date "Miocene." These contain beds of coal and fossil fish. The streams have cut narrow drains with steep walls through these beds. On opposite sides, the strata correspond; the bed of the stream is unbroken sandstone. The river course is not angular. The water winds through old, hard beds of sand rock, as water winds on sand in the prairie, or on the rippled sand beach which the tide has smoothed for streams to engrave. Since this plateau was last raised above water, these rivers have dug these cañons, of which many are at least 100 feet deep. But these are the head waters of the Colorado. After flowing more than 600 miles through a very dry country, the waters escape from the mountains into Californian plains through a winding canon, which is said to be 6,000 fe deep, and little wider than the water way. I have not en this Grand Cañon, but I have spoken with many who we explored it as far as they could get. They say that it vould be as possible to shoot Niagara and live, as to descend ne Colorado.1

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A book has been published in which is a circumstantial account of the descent of the Colorado by a miner on a raft. Certain recorded events appeared inconsistent with each other, and I suppose that the story is mythical.

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nt of the l events story is proportioned to its size. The Colorado has dammed up the head of the Gulf of California. It has cut off an ancient seabottom which has dried up, and now is ninety-four feet lower than the sea-level in the Gulf. The land now is a dry desert, with recent shells in it, and beds of salt. When the flood waters of the Colorado partially irrigate this waste it becomes a garden. Dr. Wozencraft, of the *Great Republic* steamer, informed me that he long ago proposed to irrigate the whole tract from the Colorado. It has been proposed to let in the sea, in order to increase the rainfall, and so irrigate the neighbouring dry country indirectly. Meantime the Colorado delta remains in the Gulf of California, great in proportion to the depth and length of cañons which end only where the mountains end, and begin about the head waters of Green River, where I saw them from the cars.

This kind of erosion by streams is characteristic of all the mountain regions of America south of the latitudes of Puget Sound, so far as I have been able to learn. A drain 6,000 feet deep throws the date of the Glacial period far back. Whether I take marks which can be explained by glacial erosion, such as firths, valleys, lakes, &c., or marks which clearly are not glacial, such as peaks and cañons, I find nothing in denudation to suggest a general Glacial period in America or in Europe. In plains, shallow trenches are dug by rivers; at the end of the plains is the semblance of an old beach. In the mountains are deep drains cut by the same rivers which cut the shallow drains where I suppose a recent sea to have covered the land. On this supposed sea-bottom, and there only in some places, I find traces of Polar glaciation in glacial drift, which stops near 37°, the

latitude which icebergs now reach in the Atlantic. Supposing old Polar glaciation to be marine, existing causes account for all the glaciation that I have seen between the Volga and the Pacific.

#### XI.—BEHRING'S SEA.

Now let me look forwards.

It is prove I that land in Europe and in America has been repeatedly sunk and raised. While it answered to the legal definition of "land covered with water," it was protected from all kinds of subaerial waste, and erosion by ice or by streams. But each time the land rose, erosion began again.

According to Mr. Dall and his authorities, land now covered by Behring's Sea has risen, is rising, and probably will rise above the sea-level and join America to Asia. North of a line which corresponds to the limit of northern drift in Europe, the sea-bottom will probably ebb dry, like the margins of the American lakes, or raised sea-margins, or the sea-margin between tides. In latitudes corresponding to Northern Russia and Finland, great American rivers now flow westward into a shallow sea, which has been sounded for telegraphic purposes. The Yukon enters Behring's Sea about The description of a season passed therelat. 62° north. abouts closely resembles a description of climate about the Dwina or Neva. The summer is short and hot, the winter long and severe. The rivers freeze and become roads. In spring the ice goes with a rush, carrying frozen débris, stones, timber, rafts, leaves, and mud, to spread on the flat bottom of

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a shallow sea. Each flood is like the Nevada flood, aided by ice and by the sea. Leaves and shells prove that rolled drift on Puget Sound has risen from the sea. The sea has cut through it, and now is forming terraces under water which are seen from passing ships in calms. The submarine delta of the Yukon grows in yearly glacial freshets, and by a continuous muddy flow. The shores of Puget Sound give sections of drift which seems to have gathered in the same The Alaska glaciers which enter the see in the latitudes of glacier tracts in Norway, now launch and scatter volcanic boulders from the coast range. Within the narrow limit of their marine glacial drift, the result must resemble the country about Vladikafkas, where large Caucasian stones occur on a large river delta, which leads back to a small glacier at the foot of Kasbeg. Like it the old raised marine drift of Puget Sound contains a few large erratics, but none of volcanic origin. That deposit seems to have grown as the delta of the Yukon is growing, but before the growth of the volcanic coast range.

If Behring's Sea-bottom does become dry land, the surface of it will be like the plains of Russia, the American plains, and the drift regions on the Pacific coast. According to soundings, shelving slopes and flats are surrounded by volcanoes, against which Tertiary and other beds have been tilted up or bodily raised. If the sea retires the river Yukon will follow it, cutting a trench in the submarine delta, like that which the St. Lawrence has cut from Lake Ontario to the Gulf. On the banks of the growing river, and on the growing margin of the shrinking sea, "Polar glaciation" will be recorded only by anything which ice may now carry

through Behring's Straits. As no Polar drift has been seen south of lat. 50° N. and the Aleutian Islands, modern Pacific northern drift will end at least thirteen degrees further north than modern Atlantic drift. Near Alaska local marine glacial drift will be represented by a few stones of volcanic origin, dropped from small icebergs near the shore. If the glaciers melt they will leave moraines and their marks on the hills. Water-marks and ice-marks in the valley of the Yukon will lead through plains of sand and mud to a raised sea-margin, to long deep rounded grooved hollows, to the volcanic coast range; and to the volcanic sierra whose tops now are the Aleutian islands and Alaska. Polar marine glaciation represented by erratics or by the trail of a stranded berg in the plains will lead back to Behring's Straits, and to the rocks from which the boulders came.

The new country will be very like old lands which I have lately seen. The shallow trench dug through sand and drift by the muddy Mississippi leads back to the shallow Platte, and to the deep water worn canons of the Rocky Mountains. They must be old because deep, the rivers lead back to the semblance of a sea-margin near the hills, to fans of boulders, to something like a moraine at Pike's Peak. But if the sea were back there, it would have no firths on the Rocky Mountain coast. Boulders in one part of the Mississippi Valley and there only lead back to Canada, and to the Arctic Basin, over plains which I believe to have been under the ocean when the boulders were carried to  $37^{\circ}$  near St. Louis.

Manifestly land now covered by Behring's Sea if raised will be very like land in Washington Territory which has been raised; or land about the base of the Rocky Mountains

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which I believe to have been raised. The valley of the Yukon will be like the valley of the St. Lawrence; the country near it like Russia east of Finland, about the Dwina, or Neva, or Volga.

In the probable case of Behring's Sea even Polar glacial marks will not record a glacial period. The marks which I saw in the same latitudes about the White Sea and the American lakes in 1873 and 1874, seem to record something like the present climate of Behring's Sea. If so then the period of Polar glaciation is present. An ice-cap may be growing but the glacial period is nowhere in the past.

If My friend Mr. Belt, author of The Naturalist in Nicaragua, and other works, printed his opinion on the glaciation of America in the Quarterly Journal of Science, in April, 1875 ("Niagara, Glacial and Post-Glacial," by Thomas Belt, F.G.S.). He believes in a Glacial period, during which the bed of the Atlantic was occupied by a glacier. The whole Eastern Coast of America, down as far south as New York, must have been blocked up by it. A glacier came out of the bed of the Atlantic up the Valley of the St. Lawrence from the direction of Greenland, and went over the watershed down towards the Gulf of Mexico. The same author accounts for drift in the plains of Russia by a dam of Polar ice which caused great lakes to gather there, and about Niagara apparently at the same time. He dates the Glacial period 20,000 years ago. He gives reasons for his belief, which merits all respect due to the creed of an able man who has seen a great deal of the world.

At the latest meeting of the Geological Society in June, 1875, a paper was mentioned of which a condensed abstract appears in the Report: "On the Superficial Geology of the Central Region of North America, by G. M. Dawson, Esq., F.G.S., Assist. R.S.M. Geologist to H.M. North American Boundary Commission."

The rules of the Society, and the work that they have to do, often delay the publication of papers ordered to be printed for many months. The information contained in a paper written by a field geologist, who described an arc of a circle round the Pole about lat. 49° in America, would have been very instructive for me, who described an equal arc some ten degrees further south, and joined the two circles by travelling up and down both coasts to striated rocks.

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I quote from the first abstract printed for subsequent condensation :-

"Mode of Glaciation and Formation of the Drift Deposits.—The author did not find any evidence rendering the supposition of a great northern ice-cap necessary, but suggests that local glaciers on the Laurentian axis furnished icebergs laden with boulders, which were floated across the then submerged prairies towards the Rocky Mountains.

"The Rocky Mountains themselves show abundant traces of glaciation . . . . but striation was only observed in a single locality, and there coincided

with the main direction of the valley."

Professor Dana has been kind enough to send me "Notes on some of the Phenomena of the Glacial Era, and their Origin; in Book Notices." (American Journal of Science, vol. ix. 1875.) The paper shows the stronghold of the ice-cap and Glacial period in books. Professor Dana's own well-known books, and his remarks in this paper, indicate his opinion.

The Glacial period appears to have begun to wane in North America.

#### XII.—THE PACIFIC AND ITS CLIMATE.

OCEAN circulation is much hindered in the Pacific, but laws which govern it in the Atlantic are good all over the world. Behring's Straits are but fifty-four miles wide, and generally less than 150 feet deep. Behring's Sea is shallow. About the latitudes of Ireland and Newfoundland, the way into the Arctic basin is further blocked by long spits of volcanic land, and by sunken land of the same kind; by chains of volcanic islands with shallow straits. About the northern tropic are groups of islands and shoals. New Zealand, Australia, &c., hinder the Antarctic water way. Nevertheless, the North Pacific has an Arctic and an Equatorial current, and a circulation like the Atlantic. A diagram drawn on board shows the temperature of sea water at the surface taken every four hours in crossing westwards from San Francisco to Yokohama in the Great Republic steamer, October 3–28, 1874. The

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temperature rose from 57° near the American coast, to 79° about longitude 154° 22′ E., and fell to 71° near Japan. Inside of Japan was the cold stream hugging the coast of Asia like the cold stream which hugs the American coast inside of Newfoundland in the Straits of Belleisle.

The Costa Rica sailed from Yokohama on the 3rd October, and reached Shanghai on the 10th. The lowest temperature of sea-water observed, on the 4th, near Kobe, was 66°, the highest was 77°. On the return voyage, October 15th to 24th, the lowest temperature was 66° near the same place, the highest 75°. On the next voyage from Yokohama the lowest temperature was on the 29th, after a deluge of heavy rain, near the harbour. The surface was 61° outside in the Equatorial Stream; the sea still was 70° to 66°. These four voyages in the same month show that climate in the Pacific is greatly affected by ocean circulation.

On the 8th of September the Costa Rica sailed from Yokohama for Hong Kong, running against the Pacific "Gulf Stream." The water ranged 80°, 76°, 82°, 83°, 84°, 77°, 79°, 83°, 84°, 85°, 87°, &c., &c. The vessel reached Hong Kong on the 16th. The coldest water was near Yokohama at 8 noon and 4 r.m. on the 8th, 77°, 76°, 77°. The hottest was at noon on the 16th, near Hong Kong, 87°. The air then was 88°, in the saloon it was 88°, in the after hold 92°. The average water temperature of the voyage was about 83°, the range only 11°. At the same time on the American side the average sea temperature was 57° and near Yokohama, Kobe, and Shanghai it was 61° or thereabouts. The warm water runs up towards the N.E. because displaced by cold water. These observations prove the fact.

In January 1875 I crossed the Inland and Yellow Seas in the Costa Rica and took these observations from the log. At Yokohama the temperature in the bay was greatly affected by cold land waters and by wintry air. The sea was 45°. Outside, the warm stream was 63° near the place where it was 66° to 70° in summer. There was a difference in climate of 18° within a few hours' sail. At that time while Yokohama waters were 45°, the mountains were covered with snow and ice, and the air was 25° or less. There was a difference of more than 40° between the winter climates of small Japanese islands, and of glens inland. In the narrow inland sea of Japan, temperature fell from 51° at Kobe to 46°. On entering the open China Sea it rose 4°, but still was 13° colder than the open Pacific. On leaving Nagasaki we got Pacific water at 60° during eight hours. Having crossed that lane we ran to colder water, and to the great river Yang-tse-Kiang. The water was 40°. It blew a gale, it snowed and froze, the weather felt colder than Lapland about the lat. of Suez, near Shanghai 31° 12′ N. Lat. 1.21° 30' E. Long.

It was thus practically demonstrated that climates are greatly affected by ocean circulation. On islands off Yokohama the temperature was 63°, At Yokohama it was 45°, on the hills 25°. In the China Sea 60°, near the coast in the cold stream 40°. Japan was warm on the coast while China was frozen. So Iceland has a mild climate while Greenland has an unsurveyed coast, and is almost inaccessible from cold; all because of oceanic circulation. The shape of land under water and above it affects the direction of movement in the sea. According to a late American survey for tele-

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graphs, the sea near Japan is about five miles deep, and a strong cold current there flows southward under the warm stream which flows towards the north-east. Near the Japanese coast in shallower water, hot and colder lanes move side by side as on the banks of Newfoundland.<sup>1</sup>

In the transactions of the Asiatic Society of Japan, 22nd October 1873 to 15th July 1874, are papers on marine circulation, on deep sea soundings, and on the meteorology of Yokohama. A given bulk of sea water is heavier at 33° than it is at 85° and must therefore displace lighter water and cause circulation. Captain Belknap, U.S. Navy, gives the following sample of temperature near the Tropic in the North Pacific. It gives the mechanical force which is the difference in weight between water at 33°.2 and 76°.

No.39, Lat. 23°:31 N. Long. 161° 51' E.			Feet deep	660	66.63
Surface		76°	,,	720	65.02
Feet deep	60	73.5	,,	780	63.91
,,	180	73.48	**	840	61.08
,,	300	73.67	,,	900	61.02
,,	420	73.45	99	1,080	59.98
,,	540	70.24	11	1,200	58.56
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Temperature<sup>2</sup> and weight account for movements from and towards the Equator and Poles. The earth's eastward

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<sup>&</sup>lt;sup>1</sup> The soundings made by the *Challenger*, published in the *Times* of June 23rd, 1875, confirm the accuracy of this sounding. The results of the expedition, when published, will settle questions as to oceanic circulation which bear upon climate.

<sup>&</sup>lt;sup>2</sup> The temperature of maximum density of sea water as settled by Despretz in 1837 is 25° 4 F., according to a paper by Mr. Prestwich. *Proceedings of the Royal Society*, No. 154, 1874.

rotation changes the direction. Chilled heavy water flowing towards the line lags behind and moves westwards and southwards over larger circles of latitude. Warmed light water revolving eastwards at the rate of the Asian coasts nearer to the line, displaced and lifted by heavier Polar waters, moves faster eastwards than smaller circles of latitude which it crosses in flowing northwards. The surface current in fact flows towards the north-east, past Japan, while the under current flows in the opposite direction.

The shape of the basin determines local currents, eddies, and back streams. Captain Belknap reports that the bed of the North Pacific, where then explored, consists of shelving plains of clay, oose, sand, pebbles and shingle; with occasional mountains. One near California is 4,000 feet high. Six submarine elevations, ranging from 7,000 to 13,000 feet, were found west of the Sandwich Islands. The sea-bottom has hills and plains like dry land.

It has been shown that Europe and America have risen above the sea-level, Asia also has been submerged. Japan is a plateau like that of Thibet, five miles higher than sunken Pacific plains; with volcanic cones on it rising 14,000 feet higher, like peaks in the Himalayas, about which large glaciers form; at greater distances from the earth's centre, but far nearer to the Equator. A paper by Dr. Stoliczka, read June 24th, 1874, before the Geological Society in London, shows, by describing marine fossils, that Asian land about Kashgar near the latitude of Japan has been submerged and subjected to volcanic action, and raised. In like manner, as it appears, Asian land in Japan has bulged outwards, though not so far as in Thibet.

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The North Pacific lies in a deep, rugged hollow surrounded by volcanoes: in the Sandwich Islands, in Java, in the Philippine Islands, in Formosa, Loochoo, and Japan, in the Aleutian Islands, in Alaska, in Oregon and California. Northwards, in Behring's Sea, the basin is shallow and the water is chilled. Southwards, the China seas and those about the islands are shallow, and there near the Equator water is heated to 87°.

Because the shape of a basin governs the movements of its contents the "Japan Stream," which is hindered by shallows in the north, sweeps round the Aleutian Islands, Alaska, and Oregon instead of entering the Arctic Basin. Like the Gulf Stream, it turns southwards about Lat. 50°.

Captain Brown, in treating of winds and currents in the vicinity of Japan, shows that this "gulf stream" of the Pacific does send a small branch called the "Kamchatcka Current" through Behring's Straits. It leaves the main stream about Lat. 38° N., Long. 150° E. A cold current, named Oya-siwo, of small breadth and volume, comes from the north, along the eastern coast of Yezo. It is the equivalent of the "Arctic Current" of the Atlantic. It so affects climate that the Asian coast, about the latitude of Oporto in Europe, is fast bound in ice for twenty miles off the land during the whole winter. Where these small streams of hot and cold water meet about the Kurile Islands, about the latitudes of Lisbon and London, fogs are as prevalent as they are off Newfoundland and Nova Scotia, where hot and cold

<sup>1</sup> Op. cit.

<sup>&</sup>lt;sup>3</sup> This has been denied, and confirmed by other authorities. The question will be settled by surveyors now at work.

streams meet and mingle in the Atlantic. The cold waters of the inland sea and of the Yellow and China seas are chilled by northern waters flowing south-westward through narrows, and hugging the Asian coast as the Atlantic cold stream hugs the American shore. The result is the same. Climate in China and in Labrador is colder than in Japan and Newfoundland, and ocean circulation is the immediate cause.

Circular storms, typhoons, and cyclones follow the track of these ocean streams on the corresponding coasts of America and Asia. Monsoons blow from north-east and from southwest according to the sun's position at different seasons. They do not affect the circulation of the Pacific to any great degree. Atmospheric and oceanic circulation obey the same mechanical laws. Both result from solar radiation, and must have produced like effects on climate ever since the sun shone upon the world.

According to Dr. Hepburn<sup>1</sup>, climate in Japan is in fact much influenced by oceanic circulation. In Lat. 35°, 26′ N., near the latitude of Gibraltar and San Francisco, at Yokohama the rainfall is above the average of most countries. Two-thirds of the whole fall between April and October. The snowfall is very light. Ice is seldom thicker than an inch and a half. The average temperature of seven years was 58° 22. The average rainfall 70°30 inches. The number of rainy days varied from 78 to 114. Compared to Alaska with 245 rainy days, or with Oregon opposite, this rainfall is insignificant. Compared to California it is excessive. All are influenced by the same oceanic circulation. The great

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Pacific stream warms Yokohama and the whole Pacific side of Japan. The northern side is chilled by cold streams. Birds, beasts and fishes, fauna and flora, differ on opposite sides of the Japanese hills. Rivers which flow northwards teem with salmon; none are found in beautiful rivers which enter the Pacific. Sea fish also differ as fish do that flourish in hot and in cold water.

At Yokohama, near the warm stream the snowfall is light. Inland more falls. On the hills I had a rough winter, and walked nearly 200 miles in deep snow, and on frozen ground. My glass often marked 26°. When I crossed to the northern side of these wintry hills, I found deep snow and hard Christmas weather in plains as far south as Granada, the garden of Spain. The difference was caused by warm sea water on one coast and cold on the other. The limit of freezing is raised and lowered in the air, by the movements of sea water about Japan.

Because no wide water way now opens into the Arctic Basin, no Marine Polar glaciation now goes on south of Behring's Sea. Instead of reaching 37°, heavy drift ice has not been seen below 52° in the Pacific. There is nothing like the heavy drift of Labrador and Newfoundland on the Asian coast. But Kamschatka is equivalent to Greenland. The results of circulation are the same in different degrees. The Asian coasts are colder than the opposite American coasts. The Atlantic American coast is far colder than the opposite European coasts. A region of clouds, fogs, and storms is at the meeting of hot and cold waters all round the shallow edge of the deep basin which holds the Pacific and regulates its circulation by its shape.

The circulation does in fact influence all coast climates and moves glaciers. As in Norway, so in Alaska the climate is even moist and warm on the western side of the coast range next to the warm sea. There also glaciers grow on the hills. As in Devonshire and Normandy, so in Washington Territory the climate is soft, moist, mild and warm. So far as the influence of the warm stream reaches inland, and southwards on the American Pacific coasts, there moisture and warmth prevail, and the coast range of hills is misty. Great rolling masses of cloud tower high above the coast range in Oregon, They condense and fall as rain in the next hollow. people in Oregon say that it rains for 13 months in the year. and their dusty neighbours call them "Webfoots." Their crops never fail; their apples brag the world. Beyond this happy valley in Oregon the Cascade Range, with its volcanoes, catches more of the mist of the Japan stream and distils rain and rivers, snow and glaciers. Beyond that range the next plain is dry and dusty. In that region of Oregon grapes flourish and flocks graze on yellow dried up hills and plains. Beyond that region even the Sierra Nevada fails to condense a cloud for months. Clearly, all this variety of climate in parallel bands of the same tract results not from astronomical changes or anything more complicated than normal circulation in sea and air. In California the "Golden Gate." where land waters meet the warmer sea, is commonly curtained by mist. The evening sea breeze covers the low heights of San Francisco with a nightly cap of chilly clouds. It never is excessively hot or cold thereabouts. But even there condensation rarely ge beyond mist. The next plain is dry and hot. Crops often fail there for lack of moisture. Grapes

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Atla If the enough flourish. Beyond this plain the mountains are very dry. Between May and September, 1874, only one slight shower of rain fell in the Yosemite Valley. It was considered a phenomenon and caused catarrhs. The falls then were mere rills. But for a few distant snow patches the rills would have dried. A little further inland rivers end in sinks, or feed lakes which evaporate, or dry up in salt plains. The sea air has been dried, and the sea has been cooled at the surface in flowing round the North Pacific.

While it rained little in California, in 1874, rain poured on continuously in Oregon. California was yellow dust, and heated stone; Oregon was green with rank vegetation, slippery with mud. Californians were burned as brown as their dusty fields; men of the same breed in Oregon had rosy fair pale faces. Meantime in Alaska rain poured, and the local "Glacial period" flourished there. North of Alaska was the climate of Russia. In the Northern Pacific islands the sun was hidden by thick mists and sea fogs. In Japan the sun shone or rain poured according to the wind. When I got to Canton I shivered in the tropics: when I got back to the warm stream off Hong Kong the sky cleared and punkahs wagged in the cabin to modify excessive heat.

I learned practically by travelling that climates are greatly affected by ocean circulation, and that the presence and absence of glaciers may depend on local climate.

Within its limits the North Pacific circulates like the North Atlantic; its currents affect coast climates in the same way. If the water way into the Arctic basin ever was opened wide enough, Marine Polar drift may have reached 37° without any change in the world's climate. Because large erratics are

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ry and Grapes near St. Louis, and marks of large glaciers near San Francisco, and because a glacier is on Shasta Bute in California, I crossed the Pacific expecting to find northern drift and moraines on the opposite coasts in Japan.

#### XIII.-JAPAN.

The first thing I saw in Japan was a mountain as big as "Shasta" or "Mount Hood;" of the same form as Etna; a volcano, covered near the top with snow. It was Fuji San, commonly called Fujiyama. It is the favourite subject of Japanese artists and poets; it is holy, and a place of pilgrimage, and traditions tell that it grew within the memory of the races who inhabit the country. I landed expecting to find glaciers on the mountains, glacial boulders as common on the shore as they are on the eastern coast of America, and tracks of glaciers as plain as they are at the base of Snæfell in Iceland, which is a small copy of "The beautiful mountain Fuji San."

The empire of Japan has not been geologically surveyed. It consists of a numerous cluster of islands which stand off the Asian coast as the British Islands stand off the coast of Europe, and Newfoundland off America. Yezo in the north corresponds in latitude to the Crimea, and is about as large. Kiusu in the south is near the latitude of Alexandria. Between 129° and 144° east longitude a long range of narrow mountainous islands divides the great Pacific Equatorial stream from the small Arctic current and from the shallow cold waters of the Japan Sea and the Yellow Sea.

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Off Japan the Pacific is five miles deep. The Japanese Mountains separate districts in which climates Flora and Fauna differ widely. The plains between the sea and the hills appear to have been raised in late geological times. Recent sea shells are in a steep bank of stratified sands near Tokio, the capital. That bank is an ancient sea-margin. It was a notable feature of the coast first seen outside of Yokohama, and I traced it along the coast for a hundred miles at least. From that bank the land slopes gradually towards the hills, for about ninety miles. Since this plateau bulged large rivers have done little work on it. They are kept within bounds by enormous earthworks, and their waters are spread on rice fields. Considerable deposits of gravel line the flanks of the hills at many places. I took them for raised sea-margins, but I found no shells. The general shape of these Japanese lowlands is like that of ground which has been smoothed by water.

Earthquakes constantly occur. They average one a month at Yokohama. I felt one at Tokio, and one at Kioto, three hundred miles further west. Many Japanese volcanoes either still are active or were active within historic times. One island mountain smokes in the Pacific off Yokohama. Fuji San is a full-sized copy of the largest of the cones in Oregon. It is visible from Tokio more than seventy miles from its base. Like Monte Nuovo near Naples, men saw it grow. The story is that it grew in one day.

Asamayama, about eighty miles to the north of Tokio, is constantly blowing off steam through a polished tube. It may be about 10,000 feet high. Nan Tai, distant about ninety miles from Tokio, near Nikko, is a mountain of the

same shape, with a crater lake and beds of basalt at the foot. As far as I could see in clear weather from Nikko, I saw cones like volcanoes rising from plains. Yezo is volcanic, and strewn with pumice and ashes. So far as I could make out, the hills are made of folded beds of altered crystalline rocks, through which volcanoes have broken along lines of fracture on the strike.

I travelled 90 miles north to Nikko, about as far S.W. on the Tokaido, or east coast road, to Mianoshta; and through the heart of the country westwards 325 miles to Kioto, the ancient capital, by the Nakasendo, or Middle-Mountain road. I went to Kobe, otherwise Hiogo, and steamed thence through the inland sea to Nagasaki. Thence I steamed across the Yellow Sea to Shanghai. I had the good fortune to meet ravellers, who gave me information as to other parts of this empire of Japan.

I was always expecting to find moraines and striæ, and looking out for glaciers on Japanese hills. I passed through a small Glacial period. Heavy snow fell; my glass marked 27° indoors. The sun shone, the snow melted and froze again, and glazed the whole land with a clear slippery varnish of ice. More snow fell, and heat and cold made a second coat of glazing. Then the sun got the better of it on a southern slope on a fine day, and my road become poached mud. Then frost got the best of the battle behind a hill, or at night, or under cover of a cloud. Then the road became a very rough rock, very hard to walk on. In the low grounds this state of things did not exist; 2,000 feet made the difference.

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on hillsides, in all materials of all sizes, up to long glens. The country is subject to great floods, their marks are by the rivers and in their deltas.

The islands seen from the sea are like the Greek Islands, steep hills fluted by streams, great and small. Where the coast is sheltered, these  $\bigvee$  furrows enter the sea, as they enter the plains at the foot of the Rocky Mountains, and in California, where the coasts are exposed to the waves of the ocean, as they are about Enoshima and Nagasaki; there the coast-line is battered into the usual coast forms of cliffs, with eaves, and outliers broken into spires, needles, arches and stacks, like those which abound off the west coasts of Ireland and Scotland. "The Arch Rock" at Nagasaki, "the Arch Rock off San Francisco, "the Needles" off the Isle of Wight, and "the Garden of the Gods," at the foot of Pike's Peak, are all of one marine pattern. I saw water marks familiar to me from childhood everywhere in Japan.

I was always expecting to find marks of glaciers, where I saw the foundations of glaciers laid daily and hourly in thin layers. But familiar glacial marks there were none that I could be sure of on these frozen highlands up to about 6,000 feet.

The Japanese fashion is to build wooden houses, and to plant their chief posts upon big stones. The palace of the Mikado, in the very heart of the castle at Tokio, was so constructed, and it was lately burned. The stones had been gathered from all parts of the empire. Some stood in rows where the palace had stood, others were made into rockeries, in fishponds, and in those quaint gardens in which the Japanese delight. One stone was a fossil tree sent from a great

distance to the Emperor by a great prince; most of them were granite. If there be a glaciated boulder in Japan, it ought to be in this great city built on stepping-stones. I never passed a likely stone without examination. I did not find one glaciatione in three months. I found about temples and sacred places great numbers of large, smooth, oval rolled masses of granite and igneous rocks, which might be erratics. Many of these are inscribed. The legend often is a record of the feat performed by some athlete, who lifted the stone long ago, or is now performing. When I got to the hills I found stones of the kind piled up by floods at the end of cañons, or spread in fans on the plains. I was finally driven to the conclusion that these are water-worn stones. I could find no inscription to record that ice carried one of them.

Saghalien, in the latitude of England, is frozen to the mainland yearly. The sea is frozen off Yezo, in the latitude of the Crimea. Tokio is not much further south than the Gulf of Pechelee, which freezes.

I still expect to hear that some geologist has found marks of glaciation on some of these large stones at Tokio. As the sea is frozen a little further north, sea ice may have helped to move these rounded boulders south. I found few of them near Kioto, Osaka, Kobe, or Nagasaki, inland about Lake Biwa, or on the sheltered south coasts of Japan, where earthquake waves still do exceptional work, and where typhoons commit terrible havoc. These great egg-shaped stones puzzled me, and puzzle me still. The record on the hills was plain.

There is not one single hog-backed ridge or rounded hollow on the Nakasendo road. I saw no mark of erosion

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that cannot be accounted for by water floods, like that Nevada flood which smothered a farm in 1874.

From the Missouri to Nagasaki there is nothing whatsoever to indicate polar glaciation about lat. 37°. There is nothing between the Volga and the coast of Europe to show that polar ice passed south of "the limit of northern marine drift." Along my western course, between the Caspian Sea and the coast of China, I saw nothing to prove any world's climate colder than the present. Instead of finding marks of polar glaciation on all meridians, I found no signs of an ice-cap on any one of 285 meridians which I crossed in 1873-4-5, about lat. 37°. When I had got so far and found that polar glaciation now is marine, and old marks of it local, I ceased to believe in an ice-cap. When I found that those local marks coincide with the present limit of northern drift in the longest water way now open, I concluded that polar glaciation is, and always has been, marine in low latitudes. When I had passed Japan in deep snow and biting frost, without finding any mark of any kind of glaciation on the hills, I was driven to believe that the limit of constant freezing never has approached nearer to the earth's centre, and that the present is the coldest period which this world has borne.

If this quaking earth, which shivers on opposite sides of the wide Pacific, and spouts hot water and molten stone all round the margin of that sea, and through it, is a heated mass cooling and shrinking within a wrinkled skin of altered rocks, its time for cold and rest ought to be coming on—not passed away.

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# XIV.—THE INLAND, YELLOW AND CHINA SEAS. JAPAN TO CHINA AND SINGAPORE.

The temperatures taken January 21—29, 1875, between Yokohama and Shanghai, show that the shallow waters west of Japan are affected by the seasons, by inland waters and by the Arctic current. A hundred and fifty miles off the China shore we met the mud of the Yang-tse-Kiang, which flows from Central Asia eastward, and is one of the largest rivers in the world. A storm came on; water froze on deck; and the next morning the masts were yellow with mud up to the cross-trees. The river was thick with mud, the banks were mud, and the land was but drier mud with wet places in it, covered with thousands of old grave mounds. I did not go up the river, but for 700 miles it flows through the same flat alluvial country. It passes one small range of low hills below Hangkow. There are no large stones about the river or on its banks. I could hear of nothing glacial about this part of the world, except cold, wintry weather, and snow storms near the latitude of Suez and Alexandria. The sea was frozen, and navigation stopped about Pekin. I saw only the result of erosion by one of the largest streams in the world, and a growing delta near Shanghai. But large glaciers abound in the region from which these great Chinese rivers flow.

In February we ran from Shanghai to Hong Kong against the Equatorial Stream, before the north-east monsoon. From

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water at 40° in the mouth of the river, we ran to sea water at 51°, rising to 54°, 60°, 68°. The air temperature rose from 40° to 59°. One result of a cold wind blowing over warm water was sea haze, and thick weather clouds were low on hills, and damp and mildew everywhere: water which had cooled to 63° off Yokohama, was 68° off Hong Kong. We were near the edge of the great upper Equatorial Stream of water; in the Arctic under current of air. Ships beating to windward keep further out in the stream; they go outside of Formosa, and pass the Loochoo Islands with the warm moist climate which goes all the way to Oregon.

I went inland 100 miles to Canton, stayed there a week, and never saw the sun. We crouched over fires in the tropics, and shivered at 49°, because the warm sea was too far off to warm the polar N.E. wind. It blew chilly and damp, and filled the air with clouds and haze. A hundred miles eastward at Hong Kong, temperature ranged ten degrees higher. On the 18th February we left Hong Kong and mist, and passed seawards into summer heats within a few hours. The water rose to 80°, so we passed to the climate of the stream, which we crossed twenty-five degrees further north in October at 79°. It was again demonstrated by a sudden change from winter to summer, that climates are greatly affected by the normal circulation of air and water.

I carefully watched mountain forms on this part of the Asian coast, and saw no sign of glacial action. But where ice now forms near the sea level, tropical glaciers must have grown in a general Glacial period. I saw part of a  $\Delta$  delta whose sides are about 90 miles long, growing amongst waterworn, weatherbeaten hills of red sandstone and granite. I

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The tropical cold of China drove me to believe that the present is the coldest Glacial period in the world's history.

Singapore.—The steady under current of the N.E. monsoon followed us from Shanghai to Singapore; an upper current of water which comes past Borneo flowed to windward on its way to Oregon. But it got warmer as we got south. On the 20th and 21st February water was 78° to 80°, air about the same, and rain at 73° fell from higher regions as rain falls in the tropics. Where such floods fall, where rivers begin on hill tops, full grown streams and cataracts, erosion must be in proportion. If one Nevada shower moved half a square mile of rubbish in a few hours, stones in the deltas of tropical torrents may rival moraine stones in size. Our engine broke and for two days we drifted within five degrees of the line. We sounded in 45 fathoms, and brought up gray mud like chalk full of minute shells and fragments of small creatures that flourish and float in water at 80°.

Ten or a dozen sharks gathered about the ship. We were in a warm shallow sea teeming with life, like that from which the cretaceous rocks of Kansas were deposited. But the warm waters in which life so abounds flow past Japan over water chilled nearly to freezing. Giant crabs, corals, and tropical shells live near the frozen seas of northern Japan. This modern living, floating chalk formation may reach glaciated boulders in the North Pacific.

The Straits.—About the Straits of Malacca the sea-margin

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has risen. The mark was conspicuous on both sides. High hills were conical; some I take to be extinct volcanoes. At Singapore the rocks are red and yellow grits and sandstones, much disturbed. I found no fossils. But recent shells and coral sand are under the gardens at the foot of the bank which marks the old sea-margin. Granite is found in a neighbouring island. Here close to the Equator I sought diligently for marks of that ice-cap in which I had been told to believe. I found nothing that could be assigned to glacial action.

The climate is damp and hot: people, vegetation and landscape, sea and sky are tropical. But the Arctic N.E. wind with its chilly bursts of cool rain blew steadily on to show that Arctic water and weather may reach the line if the way is open.

I have shown above that water at 33°, does reach the northern tropic in the Pacific under the warm stream, and that still colder water underlies water at 87° at the line in the Indian Ocean.<sup>1</sup>

## XV.-JAVA.

I crossed the line from Singapore to Batavia in March, and the Arctic wind followed towards the vertical sun. Great pillars of cloud covered the sky by day, which turned to pillars of fire by night. Thunder growled, blue lightning

<sup>&</sup>lt;sup>1</sup> The results of the *Challenger* expedition stated in the *Times* of June 24, 1875, show that a great layer of cold water underlies the warm surface water of the Pacific. My old inductions have been tested experimentally and are true. See *Frost and Fire*.

flashed, and rain poured as it pours in the wet monsoon. I, a West Highlander, never saw such rain before. The coasts which I saw were long flats, covered to the water's edge with dark green jungle. Conical hills rose like islands in the forest. Round islands rose in the sea, crowned with trees. We passed whole palm trees adrift in the warm current. The sea grew warmer. It was \$2° in the Straits of Malacca, \$3° near Banca, \$4° near Batavia, \$5° near Samarang. There was nothing whatsoever near the Equator to suggest the presence of the Antarctic ice-cap.

There was much to suggest a late rise of land over a wide area. The shapes of the hills are volcanic or water-worn, the low grounds like a sea bottom, the islands were like the tops of hills surrounded by coral walls and shining beaches of white sand.

From Batavia I went up 800 feet in 40 miles to Buitenzorg. There from March 9th to 14th we lived in a temperature of 75° to 77°, at the base of a volcanic cone 7,000 feet high, which was clear only once for a few hours. The air was thick with moisture, the rivers were red with volcanic mud swept down by the constant drizzle and heavy rains which fell continually. The colour of this tropical landscape was greyer than the West Highlands; the sun shone less than it does on the Argyllshire hills in mistiest winter weather. But when the clouds opened the sun shone with might.

In the famous botanical gardens I got seeds which drift to Novaya Zemlia; one plant of the *Entada Scandens*, a native of Java and Ceylon, is ten years old. The creeper has a small leaf and flower, and grows a pod near three feet long. At the root it is as big round as a man's body. It climbs to

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the top of a high tree, swings thence like a ship's cable to a oon. I. clump, and spreads over it for more than a hundred yards from e coasts ge with the root. I had got to one place where seeds grow which I have gathered from distant sea coasts. They start near the in the straits where the Equatorial stream of the world divides. i trees. Small branches enter the Indian Ocean. The stream rounds current. the Cape of Good Hope and becomes the "Atlantic Gulf Ialacca. Stream." The main branch, turned by the islands, and by There est the the Malay Peninsula, flows round the North Pacific. It starts at a temperature of 86°. I crossed it off Japan at 79°. Equatorial water keeps the sea open near the entrance of the White Sea, where I crossed it in August 1873.

> In these same Java gardens a mountain stream has worked havoc, rolling great stones of volcanic origin down towards the plains. On the east side of the mountain tropical rains have cut a deep ravine from the crater, to the plain proportioned to the size of a delta below the cone. The stones were equal in size to stones moved by alpine glaciers. I sought carefully and found no sign of glacial action on stone or rock. I crossed at the foot of Pangarango an extinct volcano on whose summit Wallace found an isolated northern flora growing. He accounted for it as a remnant of the Glacial period. If the seeds of Entada Scandens float to Novava Zemlia, seeds may float from Greenland to Florida. When the Asian coasts were sunk, northern seeds might float from Kamchatka to Java in a Pacific Arctic current. Birds might carry them to hill tops and to the cool tropical climate in which these plants now flourish. A primula seed entangled in thistledown might fly with the N.E. monsoon from Northern Asia to Pangarango. One great gift presented by a native

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prince to the Dutch was a sea-nut. It was the double cocoanut which grows only on the opposite coast in the Seychelles. The tree now grows in the gardens at Buitenzorg. That same double cocoa-nut has drifted to the British Isles. It does not require a Glacial period to account for the transport of small seeds to the top of a newly grown volcano. I travelled 360 miles overland in Java, and found no sign of glaciation. I found marks of floods and the floods themselves, and signs of recent elevation of land. I saw volcanoes in abundance, and heard of a recent outburst of volcanic mud which did great damage at the eastern end. Heat, wet, bad reand a broken carriage sent me to sea at Samarang.

On the return voyage to Singapore we passed a "bee-eater" 150 miles from the nearest land. Land-birds are commonly seen on this voyage. We met hawks and small land-birds a couple of hundred miles from Japan. Narrow straits cannot bar the passage of flying creatures. The sea was covered with land-drift washed down from Borneo and Sumatra. Large palm trees were abundant; flowers, fruits, and leaves in the strait which opens to the Indian Ocean. On the beach at Singapore I picked up many drift fruits; but after a long search I failed to get a "Malacca bean" in the Straits. At other seasons these seas are covered with drift moving westwards from the Archipelago towards Java and Sumatra, the Straits, and the Indian Ocean. Tidal currents set in and out, but the drift current sets westwards, and generally prevails in the narrows.

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## XVI.-CEYLON.

I SAILED from Singapore April 2nd, and reached Galle on the 7th. The sea water was 85° all the way. Rocks at the end of Sumatra, exposed to Antarctic waves, are battered into the usual forms of stacks and spires. The mountains about Acheen seemed to be volcanic cones; the low coast lands a raised sea-bottom, with battered rocks in the forest. I had the fortune to meet a gentleman who had been surveying in Borneo. The low, swampy coast jungles there have isolated granite "Tors" in them. He saw nothing glacial and nothing volcanic, so far as he travelled in Borneo.

Ceylon has not been geologically surveyed. The mountains rise from a broad plain, which surrounds the mountain The plains end with a white sandy beach, in which are battered rocks. Many rocky islands of the usual surfbeaten forms stand off the eastern coast, with a tall lighthouse far out in the sea. Rocks in the plain have the same forms as rocks in the surf, and at sea. If the sea-bottom were raised, it would be an extension of the low lands of Ceylon. From the steamers, while approaching, and while leaving the island, I saw from a distance the usual marks of erosion by streams on the hills, and of marine erosion in the plains and in the surf. I travelled along the eastern coast seventy miles from Galle to Colombo on a plain, thence by rail and coach to Newera Elliya 105 miles, up 6,500 feet. I went to the highest point in Ceylon, the top of Pedro Tullagalla, 8,000 feet above the sea. Thence—riding, driving, and walking-I travelled southwards through the hilly coffee

districts to Kandy. Thence we travelled northwards downhill to Dambool, and out into the plains to Anaradhapoora and Kurenegalla, to Negumbo on the coast. Thence I returned by Colombo and to Galle. I travelled nearly 600 miles in Ceylon between April 8th and May 17th. I could find no mark of glaciation whatsoever.

The rocks near Galle are red sandstones and grits, greatly folded with a northerly strike, very like the rocks at Singa-I could find no fossils. These beds are traversed by dykes near Galle. The beach is constantly beaten by a heavy surf, and the rocks are worn with fine sand. Harder beds or dykes rise in the surf, worn and rounded. Their shape varies with the composition of the rock. Where the beds are on edge, and the dip nearly vertical, the rock is fluted and channelled vertically. Where the beds are horizontal, the softer parts wear horizontally. But the action of sand and water rounds the rock by ceaseless slow waste. Whenever I saw a rock in the surf on the coast of Ceylon, it was a rounded smooth boss. On the railroad, in the hill country. and so far as I travelled northwards, the rocks are crystalline gneiss, greatly folded and contorted, with the same northerly strike. On the Peak the beds dip 72° N.E., and strike N.W., S.E. Garnets abound there; gems are found in gravel elsewhere. I saw large plates of mica and glittering stones of divers sorts and colours. Beds of marble occur near Anaradhappora. The sculptured stones of that ancient capital are hearn out of crystalline white limestone, which weathers red. In the north of the island are recent beds of coral. As I have said, the beach is sand. Sand underlies mud and soil near Colombo. Cinnamon and cocoa-nuts grow in sand

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vel elsetones of of the same kind far inland, near Negumbo. Further inland the loose soil of the plain is chiefly made of small angular débris, weathered off the gneiss which is close under it. I saw no gravel on the beach. I could find no beds of gravel, no clay, and no fossils, and I could hear of none in the plains inland. I suppose that all the sand was washed off this plain of crumbling gneiss. The plain rivers, which rise twenty to thirty feet in floods, leave beds of angular sand when they fall. Only near the hills I found rolled stones in river deltas and in water-courses.

There are no lakes in the hill country. About 1,300 tanks have been made in the low country by constructing "Bunds" in hollows. Lagoons surround the coast. They are natural tanks, banked seawards by sand thrown up by the surf and, overgrown to the water's edge with cocoa-nut palms. In these shallow hollows land waters gather, and boats sail hundreds of miles close to the sea-beach. There is nothing like a firth on the coast.

The only rock basins are pot holes and "giants' tubs," which occur in water-courses and about rocks which stud the plains. There is no sign of glaciation in Ceylon. But ice forms at Newera Elliya when the sun is south of the Equator. On the 12th of April, when the sun was nearly vertical, the temperature on the grass at sunrise was 52°. A general Glacial period must have lowered the freezing limit here, and water enough falls to make big glaciers. Ten inches fell in twenty-four hours on the 10th of April at Colombo.

The mountains are everywhere seamed with V ravines cutting through the hard gneiss in all directions. There is not one rounded hollow or hog-backed ridge in Ceylon.

The low grounds which I saw I took for very remarkable examples of marine denudation. Ceylon at the end of Asia is exposed in all directions save one to the full sweep of the waves of the Southern Ocean. The surf rolls constantly in over a shelving bottom. At the sea-margin and thence to the hills the shelving surface cuts indifferently through all the folds in the gneiss.

Where a hard spur extends northwards on the strike from the mountain district, it is prolonged in the plain by isolated hills and bosses of the same hard stone. Some are near 2000 feet high. These rise like islands in the jungle. Some are square like "the Bible rock," and some are furrowed by streams like rocks in Galle harbour, some are rounded; most are bare gneiss weathering to angular sand, and wearing into chemical and mechanical potholes. On some few of them great blocks of the same stone are poised like rocking stones in Cornwall. I could hear of no "erratics" and I saw none. I attribute these blocks to weathering.

The Elephant rock at Kurene-galla is somewhat like a couchant elephant; from some points of view it rises 700 feet above the plain. The gneiss there is much contorted: the dip is nearly vertical, and the strike and long axis of the hill are northerly. Distant hills on the same strike are broken to the westward. Great part of this strange rock is bare. It shells off in thick layers which correspond to the curved surface, not to the bedding. To avoid slipping on a slope of 30° I walked down barefoot, and realized the effect of tropical heat. I could hardly endure the heated surface. To a given depth the gneiss is daily heated to 100° or more. At night it cools. Expansion and contraction produce some-

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Fresh and growing pot holes are in the bare gneiss. "The King's bath" on the Elephant rock is a round basin about 20 yards wide, full of rain water and rotting leaves to make acids. The stream which flows out of this natural bath is wearing smaller pot holes below. Such rocks weathering and worn stud the plains of Ceylon.

Caves commonly are sea marks. They occur at considerable heights in the rocks. The rock at Dambool is 350 feet higher than the plain. Near the top is a cave under a ledge walled in like a miniature copy of Magaspelion in Greece. It is a rock temple. Inside are images of Buddha and his disciples, the fabulous Naga Rajahs, and mythical or historic kings of Ceylon. Roof and sides are covered with painted legends and ornamental designs. No weathering goes on there now. The painted roof has the shape of many a well-known sea cave in which I have slept. The look-out from the hill top over the green jungle with its gray archipelago of gneiss rocks suggests a sea on the plain. This cave and others like it may be of the age of the coral rocks in the north.

A rock temple at Anaradhapoora is hewn out of a shattered worn mass of rocks like rocks in the surf. It was sculptured by the hand of man some two thousand years ago, but the surface on which elephants were then carved in low relief still bears the marks of sea waves.

These rocks, plains, and hills of Ceylon are remarkable.

They might easily be mistaken for glacial work. After
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careful study, I believe them to be the work of the Indian Ocean, aided by a tropical sun and tropical rains.

The folding of the gneiss was by lateral horizontal pressure from E. and W., nearly parallel to the Equator.

#### XVII.—THE INDIAN OCEAN.

If ever the world was covered with ice, marks of it ought to be found in the southern hemisphere, where Polar and drift ice now come nearest to the Equator, in latitudes corresponding to old marks north of the line or in still lower latitudes.

The southern portion of the ocean which is bounded by Asia, Africa, the Malayan Archipelago, and Australia, and which beats on Ceylon, has a system of Antarctic circulation. In the "Indian Ocean," under the line, cold water at 30° flows under surface water at 85°.

There are no glacial marks in Java or Ceylon, and so far as I know none have been found on the African coast between the Cape of Good Hope and Cape Guardafui. The general system of atmospheric circulation goes on above the Southern Ocean: N.E. and S.W. monsoons follow the sun over the line. The circulation of water goes on in the same fashion so far as the shape of the hollow permits the water to circulate.

We fell in with the S.W. wind on the 20th of May, about nine degrees north of the line, when half way between Ceylon and Aden. The wind was due at Ceylon about that time. It was a cool, damp, pleasant wind which brought

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rain and thunder, and lowered the temperature 7° to 79°. The water grew warmer as we got to the western side of the basin. It was 85° to the east of Ceylon. It was 86° in spite of the colder rain of the monsoon. It was 88° at Aden. For some days it rained heavily, and blew in squalls. The sea rose, the rain beat down the sea and smoothed the waves. It thundered often, and waterspouts whirled past northwards. The sun rose astern amongst detached clouds like islands in the east, a rainbow arch on dark blue rain clouds, and a darker sea was ahead to the west, in the monsoon.

We steamed into the flank of the Antarctic wind which had followed the sun over the line so far towards the northern tropic, bound for Asia, to carry the rainy season to India and to build glaciers between 27° and 28° N. We crossed the path of the same wind in the same wet weather, till we sighted Socotra and Africa. Then we got to dry weather, variable winds and a clear sky with high tropical clouds in it. We had gone through the weather by which Germans explain Indian mythology. Cape Guardafui and the islands near it are bedded rocks broken into sea cliffs and little disturbed. There was nothing glacial about their forms.

# XVIII.—ADEN AND THE RED SEA,1

ADEN is part of a large broken crater. The axis of a uined cone is in the harbour. Seen from a distance beds

<sup>1</sup> I learn from a Paper by J. Milne (Quarterly Journal of the Geological Society, No. 121), read January 1875, while I was in Japan, that the bottom of the Red Sea is rising. Reefs have shoaled four fathoms within twenty years in the Gulf of Suez. If that is a fact the canal will dry up; as it has not dried, the fact needs proof.

on both sides dip away from the axis at an angle which records the existence of a mountain as large as the volcanoes of Oregon, Japan, or Java, say ten or twelve thousand feet high; or of a crater as large as the base of such a cone, like Tankaban Praw, which has not yet grown to the full height of its neighbours in Java.

Sea water at Aden was 88°, the sky clear, and the sun's rays very powerful. On the beach I found a recent formation of sand, shells and broken coral. The rocks on which this rests are volcanic, bleak, barren, weathered and shattered, with beds of blown sea sand in hollows. The great Aden water tanks were dry for lack of rain, and water stills were at work on sea water imitating nature whose fire is in the burning sun.

Why are these tanks dry, and why is Arabia a parched waste within a few hours steaming of the recurring rain floods of the south-west monsoon? South-west of Aden, on mountains high enough to be cool, are swamps and great lakes which feed the Nile. The S.W. wind drops its load of distilled sea water on these condensers, about the line, in Africa. Aden is dried up and the Nile overflows in Egypt, because water raised by the sun in the South Seas is condensed in Africa, before the S.W. wind gets to Arabia. Daghistan also is dry, because the south-west wind is dried before it gets to the Caucasus. The Caspian Sea, though fed by the Volga and other large rivers, keeps down its level by evaporation. Salt Lake is shrinking in America, so is the Dead Sea in Palestine. All because of atmospheric circulation, and the position of land raised high enough to catch and condense fresh water distilled from the salt sea by the sun's rays.

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On the 26th of May we passed a group of volcanic islands in the Red Sea, north of Aden. Some truncated cones are nearly perfect. Other hills are finished cones three or four hundred feet high. Others are fragments of broken cones and craters weathered into strange shapes like Aden, but with their conic structure manifest in all sections. In some are recent faults and fractures. On the sides of many of these island hills waves have made cliffs.

About 1 P.M. on the 26th we passed Gib-el-teer. It is nearly round, from two to three miles in diameter, and about four to five hundred feet high. On the chart it is marked as little more than a mile wide. It certainly is far wider now. It is surrounded by a raised sea margin. From it rises a low perfect dome of dark volcanic rocks, cinders and thin white beds. On the top of the dome are two small volcanic cones. In the top of the highest is a small white crater broken to the north-west, from which some mineral spring has flowed leaving a white curved mark amongst the black ashes on cone and dome. This island has certainly risen bodily. Probably the raised beach and the long hollow slope below it mark a very recent elevation of this volcanic area. Where I could see the coast further north, I saw conical hills and a low raised sea margin. That sea mark is conspicuous at Suez. The whole isthmus would be submerged if the Red Sea were at its old level.

Except in the Westmanna Islands, off Iceland, I never saw volcanic forms and sections of them so numerous and conspicuous in a small area on a small scale. I had never heard or read about these islands. These monuments of recent volcanic activity and of enormous waste at Aden may

account for recent sea shells, and beds of rolled stones in the sands of Arabia and Northern Africa, and for the older bedded rocks which are well seen in hills near Suez.

This part of the world's crust has bulged outwards, for these older bedded rocks have been bodily raised in the bed of the Red Sea; and the crust has broken, so as to let volcanic fountains of fused stone rise. Igneous rocks abound on the Sinaitic peninsula, and between Aden and the Caucasus; between Gib-el-teer, Etna, Stromboli, Vesuvius, and Santorin. I saw a bed of basalt in a scarped hill near Suez. A prolongation of the hollow which holds the Red Sea cuts through the volcanic area of the Greek Archipelago, where volcanic eruptions, and earthquakes, and movements in the earth's crust, have raised and lowered the sea margin on islands within the last few years.

The world's crust is in motion on opposite sides of Asia, about the same latitudes in Greece and in Japan. Rocks at Singapore and in Ceylon have been crushed from east and west between two long lines of volcanic hills, which indicate fracture in the crust under them. I take the Red Sea to be a mark of a fracture in the crust. On it we met a strong, north-west, cool wind, which blew steadily for five days along a course of 1,300 miles. We had the same wind nearly all the way to Marseilles. Not one of the cloud forms which had been common all the way from Hong Kong remained. I have never seen these cloud forms out of tropical regions. The temperature of sea-water fell from 88° at Aden to 70° near Suez. Air temperature fell from 86° to 71°. Water in the shallow bitter lakes was 74°. In the Mediterranean, 75° to 70°.

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r Suez. hallow Along the coast of the Red Sea from Aden to Suez, a raised sea margin proves that the Mediterranean once joined the Red Sea. The whole tract has bulged outwards, raising bedded rocks more than 2,000 feet, which still are horizontal or slightly inclined at Suez. Erosion by streams is a marked feature of these dry Egyptian hills, as it is in dry Daghistan or in Nevada. On the shores of the Caspian and Black and White Seas, and all round Scandinavia, I saw raised sea margins on opposite sides of the plains of Russia in 1873. I returned to the Mediterranean from a round of the world in June, 1875, satisfied that northern glacial drift in Europe is marine, and records a recent elevation of this European area by the forces which still cause the earth's crust to bend and break in Japan.

South of the limit of northern drift in Europe I saw no signs of glaciation in 1873 in Russia, in the Crimea, in Turkey, Greece, Italy, or France; in 1875 I saw none in Egypt or Arabia or on the coast of Africa to Guardafui, in Sicily or on the coast of Corsica. I saw none in Caylon or Java, in China, Japan, or California. Neither north nor south of the line could I discover a mark of an ice-cap or a record of a general glacial period.

## XIX.—CAUSES OF GEOLOGICAL CHANGE.

ACTIVE causes of Geological change which J have seen at work are those which must have long acted. I mean the normal circulation of air and water on moving solids. The sun's heat rays now suffice to make gases and fluids circulate.

Where these rays have least power, there water freezes. The earth's heat does not suffice to warm water five miles below the sea level in the Pacific. But the earth's internal heat, and cold outside, do move the crust on which ocean and air are moved by the sun's rays.

Movements in the crust alter the direction of movements in the ocean and in the air; and so affect climate, evaporation, and condensation locally. The surface is most worn where most rain and snow fall on it, where the largest rivers and glaciers flow, and where the largest waves beat hardest. The waste of worn land gathers in hollows. The hollows become high grounds where the earth's crust breaks or bulges outwards. Hills sink into hollows, and may become islands, or disappear in an ocean where the crust folds inwards. Raised beds of sediment with their fossils are the crumpled stone books from which geologists translate chapters in the world's ancient history. Antiquaries and historians read for later chapters, but geological changes still are slowly going on. Earthquakes at Yokohama are as real as the ancient ruin of Pompeii. It is work fit for astronomers and men of science to explain still older chapters, to account for and explain the secular cooling of the earth and its effects on the surface of the globe.

I have found no geological record of an astronomical glacial period in travelling westward from the Caspian round the world through Egypt to England.

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# XX.-FRACTURES AND VOLCANOES.

The Nakasendo or middle mountain road of Japan led me past the base of a volcano called Asamayama. It is a truncated cone, shaped like Vesuvius in 1842. For more than twenty miles on each side of it the soil is made of alternate beds of red and white pumice and ashes. I suppose that 400 square miles may represent the area which was covered partly within the memory of old men. I estimate the height of the mountain at 10,000 feet above the sea. On the southwest are a series of six or seven broken rings—the remnants of older and larger cones and craters like Somma. Great cliffs of basalt, near a thousand feet high, face one glen through which I passed on my way from the plains. Pumice cone, craters and basalt were all thrown up from below. In December, 1874, cone and country were thickly covered with new snow. I did not try to go up. It was cold below, and the hardy natives said that a man could not speak for cold on the top of their mountain. I found it hard work to wade through snow on the road. Through all this snow and cold, enough steam was blown through the crater to drive all the engines in Japan. Hot springs are numerous in the whole region. The needle was affected near the mountain. About thirty miles from it is a rock of magnetic ironstone to which picks and shovels adhere. Fuji San and a neighbouring island in the sea, Asamayama and Nautai are four great volcanoes on a curve of about 180 miles. So far as I could make out, they are on the strike of folded beds of altered rocks which only show in deep water courses. These

volcanoes are on a fracture in the earth's crust. Westwards of this fracture are large tracts of bedded granite, amongst which occur the famous rock crystals of Japan. Newer rocks, all much fractured and folded, extend westward for three hundred miles, as far as I travelled.<sup>1</sup>

Great as the force of volcanic action has been and is in this region, the force which bent and broke the older rocks of which this part of Japan is made was far greater. It is an active force, for the earth still is shaken by earthquakes. The earth trembles almost incessantly. Every now and then it shakes down houses, and make trees bend as in a storm of wind. Land levels altered lately in the plains near Yokohama, so that a river course in the plain became a pool of standing water. The crust of the earth was bent or tilted up. The ground opened so that a road became impracticable and had to be remade. The crust there broke. This is now going on in Japan, which is a plateau five miles higher than the basin of the Pacific near it.<sup>2</sup>

Fractured and crumpled beds of sedimentary rock, and volcanoes active and at rest, extend from beyond Java to Japan, and thence all round the North Pacific to Am

In this case I suppose that the bedded granite will turn out to be part of the stump of a ruined cone like those which still bud and blossom in these snows.

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<sup>1</sup> Mr. Judd, in his paper on the "Secondary Rocks and," of which part was spoken January 21st, 1874, and the whole part was spoken January 21st, 1874, and the whole paper 399): "The great intrusive masses being, as it was the reason of a tree of which stem and branches and leaves are represented by the dykes, lava streams, and cinder piles of great volcanic cones."

<sup>&</sup>lt;sup>2</sup> On my return I found the Geological Society busy with questions about subterranean forces, and their action on rocks at great depths. These forces are busily working and altering the surface in Japan now.

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s about e forces There from Alaska down to Cape Horn rocks are bent and broken. Hot waters and vapours, and hotter lava rise from below; the earth quakes and portions of the coast rise and fall, bend and break.

The first experience of an earthquake is apt to suggest new thoughts even though the shock may be no greater than the rumbling of a dray cart on a paved way. Land in Europe, in America, in Asia, and in Africa, has sunk and risen, rocks deposited flat have been bent and broken. The first earthquake shock demonstrates that which disturbed rocks record. The world's crust still is in motion. "It has a core of fire and a crust of fossils." <sup>1</sup>

The plains of Russia which I crossed in 1873 are little disturbed, but rocks of which they are made are tilted up in Scandinavia, in the Caucasus, in the Alps, and in the Ural Mountains. As the earth's crust is in motion, these plains may have bulged a little so as to shift the bed of the sea. A line of fractured sedimentary beds altered and disturbed, and of granite and other igneous rocks protruding through fractures in the crust, extends from the Atlantic Coast of Ireland, eastwards to the coast of China, at Amoy and Hong Kong and elsewhere. In Japan rocks are crumpled and faulted, and there also igneous rocks fill cracks. There along the strike of folds in sedimentary rocks volcanic cones have risen, and through them hot water, and smoke, and steam, and lava rise continually. The new feature in my experience was that I felt the earth's crust moving under me, and heard the houses rattle over me, and awoke to think once more why the earth's crust moves.

<sup>1</sup> Oliver Wendell Holmes in Elsie Venner.

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Anteclinal ridges and synclinal troughs and faults in the Pacific Coast range, in the Sierra Nevada, in the Rocky Mountains, and in the Atlantic coast range of North America agree in general strike with the main lines of volcanic activity there. As in Europe so in North America—which I crossed in 1874—sedimentary rocks have been little disturbed in wide tracts between wrinkles. The earth's crust has bulged there enough to move the sea from the place where shells and fish lived, in cretaceous times at all events. There the crust appears to be at rest now. These spring waters are cold, and volcanic action is unknown. But old fractures and wrinkles cover the face of the globe. It seemed to me when I felt the crust move and heard it in Japan in two cities 300 miles apart, after travelling there from the banks of the Caspian, that nothing less than a general slow contraction of a cooling world can explain the sidelong crush which has crumpled rocks on the scale which I had seen on my round. Manifestly if all folds in the crust which I had seen were smoothed, the world's circumference would be greater. The world has shrunk. Because of volcanic activity the globe must be hot within, because it has contracted it must have cooled. Put if it was hotter, where is the place for a glacial period? If it existed where are the marks? I had sought them in vain.

Mere volcanic action, great as it is, will not account for nearly parallel wrinkles extending from the Atlantic Basin to Cape Horn, between the Atlantic and the Pacific.

Between San Francisco and Fraser River volcanic action is conspicuous for more than a thousand miles upon one American line of disturbance along which I travelled. The coast range contains beds of coal said to be of cretaceous age.

It consists of beds much altered, disturbed and fractured. In them occur ridges and dykes of granite and porphyry, and metallic veins. The Sacramento River flows inland from this range past the base of the volcano called Shasta Bute. The sands of the Sacramento contain gold, but no gold has been found in any feeder that flows from the cone of Shasta, or from any other volcano. The gold came into the altered rocks of the coast range with quartz before the volcanoes grew.

The Cascade range is nearly parallel to the coast range in California, in Oregon, and in Washington Territory. It consists almost entirely of basalt and other igneous rocks. These beds are three or four thousand feet thick where I passed them on the Columbia River. In plains in these regions basalt covers the whole country. From the mouth of the Columbia River to the Dalles the river banks are basaltic or alluvial. All neighbouring hills that I reached are igneous: so are all the rocks over which rivers fall in the plains of Oregon. Floods of fused stone have poured over each other at long intervals, burying in turn old surfaces on which trees grew, rivers ran, fish swam, shells lived, and life abounded on dry ground. They seem to have come from a long fault. In the Cascade range sheets of more recent lava have cooled. have broken and sunk down, and have been raised like lavas in Iceland. The world's crust has bent and broken there. Further east are more flats of basalt, and of lava, and dry plateaus seamed by deep cañons. Smoking volcanic cones, hot springs, spouting geysers and other signs of volcanic activity prove that the world is hot under the winter snow in North America all the way from the sea eastward from Oregon to the head waters of the Yellowstone, and the History Dept

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"National Park," which Dr. Hayden discovered, explored, described, and tried to preserve. At the east side of the Rocky Mountains are hot springs. The area of volcanic activity is very wide in North America. High above the Cascade range of basalt tower snowy cones of lava and ashes, which reach 11,000 feet, 14,000, and even greater heights. All that I saw were of one pattern, finished cones with the longest slope to the south-west. They came through the older basalt on the axis of the range singly and in groups. Some smoke and are active, some are at rest, but hot at the top; one has a hot sulphur spring in the crater, another has scattered ashes far and wide in late times. They are volcanoes like those of Japan or Iceland, or Java, or Sicily, or the Sieben Gebirge near Bonn; or like those old volcanoes which Mr. Judd inferred from them remains in Skye, Mull and elsewhere, in Scotland.

Instead of one Etna standing 10,874 feet high, or a group scattered over an area as big as Ireland with Hecla for chief, 5,000 feet high; ten or twelve cones as big as Etna, or bigger, stand in line on a ridge between the Sacramento and Fraser rivers. But the broken line of this fiery regiment of giants surrounds the Pacific from Cape Horn to the end of Java. Many of the same tribe are in Africa, and some are within the Antarctic circle. When weather is clear in Oregon, one or two or three of these cones appear from their usual cloud coverings glittering above the lower blue ranges of basalt and dark forest, shining like clouds in the blue sky. Some are a hundred miles from the next of the kind, but basalt makes the line continuous. In calm clear evenings each cone is apt to condense a small cloud canopy. I have seen a row of grey clouds high up in a hard clear sky

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answering to the place of snowy cones far below my horizon, which I had seen in travelling many hundreds of miles along the line. All this is volcanic work on a very grand scale, sufficient as it would seem to prove that the world is hot below us, but the fracture and folding of old sedimentary beds in Oregon and elsewhere in North America is far greater work, for which volcanic outbursts do not account. Cones result from a force which throws up a fountain of rubbish through some opening. Flats and ridges of lava and basalt were floods of melted stone which flowed through some long break in the crust. A sidelong crush alone accounts for long rifts through which such vast floods and fountains escaped, till the force within conquered itself and sealed the opening. A sidelong crush from east and west alone accounts for the strike in the mountains of North America; for the general folding of rocks in that wide area; and for the lines of fracture through which basalt and volcanic cones rose in that part of Western America which I have seen. Such crushing may account for the bulging of a whole shattered continent, and for the sinking of the bed of an ocean with all its hills. Nothing less than the general shrinking of a cooling world still hot within, can account for such volcanic action, and for the crushing of the whole crust.

That which is true of Japan and North America is true in Java, close to the line. A long array of volcanoes is ranged on the strike of altered rocks, so far as I could see rocks for the tropical forest which covers everything. Some of these cones are finished, and the force which built them has broken out at the base in a last effort. Some are truncated and unfinished, with cones growing in their craters. Some are

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cones which have not got beyond the stage of a great ring, surrounding the axis of a growing cone. Some are broken, and these probably are the oldest samples. All the forms that I saw in America, Japan, and Java, I saw in miniature at My-Vatten in Iceland. The growth of a volcano is according to fixed mechanical laws which models explain.

Alluvial plains extend from the Javanese mountains to the coast, and seem to be raised sea bottoms. The cones have their longest slope to the westward. They are deeply seamed by water-courses. Great stones are in deltas near the steep hills. Red mud is everywhere: in the rivers, on the plains, on the sea margin, and in the sea. The last matter erupted in Java was red mud. The rivers have done little work on the plain. In the hills, marks of erosion are proportioned to the floods of tropical rain which pour in these wet, hot regions. There as in Japan, and in North America, volcanic action accounts for mud, and ashes, sulphur, and hot water thrown upwards to build cones 12,000 feet high. But something greater is needed to account for the lines of fracture on which these cones are built, and for the bulging of the crust which has raised the Malayan Archipelago from a coral sea. The internal heat and secular cooling and contraction of the earth appear to me nearly as manifest as the sun's heat and his light. That which is true of Europe, America, and Asia, is true of Africa. Volcanoes are active or recent near areas which have risen from the sea. Something common to the whole earth is needed to account for the raising of marine formations which geologists study in all quarters of the globe, and that something appears to be the secular cooling of the earth which again makes a past glacial period improbable.

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## XXL—THE AGE OF OREGON DRIFT.1

A GLACIAL period is improbable in the history of a cooling world. American geologists attribute the rise of the Rocky Mountains to disturbance in cretaceous times. There has been no general Glacial period in the Rocky Mountains since they rose, because of deep canons and other old marks of aqueous erosion, and because there are no conspicuous marks of any general glacial action between the Mississippi and the Californian lake district.

Some of the ranges in Oregon are newer than cretaceous times, because fossils of that age have been found high up on Shasta Bute. The volcanoes of the Aleutian Isles are newer than tertiary beds which occur on their flanks. The volcanoes of Japan are of recent growth; those of Java are growing. The Oregon cones are newer than gold veins, which traverse Jurassic rocks according to local geologists. No gold-bearing veins have been found in Californian traps or lavas. No washed gold has been found in any streams which flow from volcanic cones on the Pacific coast. But natural gold-washing went on before the volcanoes grew to their present size. East of California, in Nevada, miners have "struck" old river beds with rolled stones and washed gold in them beneath beds of igneous rock. So they told me. I found petrified trees in

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<sup>1</sup> These notes were made while travelling rapidly through a new country, thickly covered with dense forest, and obscured by frequent mists. To work out the volcanic phenomena of Scotland alone has cost the whole power and time of geologists and geology. I therefore write with hesitation about Oregon.

a bed of sandstone under a bed of rolled stones cemented together, which bed passed under about 4,000 feet of basalt at the narrows of the Columbia River, in the Oregon "Cascade range." Where the river has worn the top of this sandstone bed, the old stumps stand in water, as if the trees had lately been felled. They grew before Mount Hood, which is near the place, and 11,000 feet high at least.

North of Columbia River it seemed to me that sheets of basalt cover part of the Northern Drift, which extends northwards over the whole of Washington Territory. At Victoria, that drift overlies striated rocks in Vancouver's Island. Along Puget Sound the northern drift is chiefly composed of beds of rolled stones, sand, and gravel, two or three hundred feet thick at least. Amongst these beds recent sea shells occur at considerable heights. In this marine drift beds of lignite occur. One is twelve feet thick, and the timber rafts buried in shingle are little altered. Lumberers think that they can recognize trees of growing species. At rare intervals a few large erratics standing in the growing forest, or left in the bed of a stream, or recently washed from a gravel bluff by the sea, give this marine drift a glacial character. Striæ at Victoria demonstrate that heavy ice there passed southwards over the rocks before they were covered with Northern drift. The drift is newer than these ice marks. It is older than the Cascade range, for I could discover no stones of volcanic origin near the mouth of a large river, which enters Puget Sound, near Tacoma, and flows from Mount Rainier, a volcanic cone, on which I saw what I supposed to be a glacier. All the stones that I could find there, great and small, were smooth rolled fragments of granite, quartz, and hard rocks, like those

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a so till which I have seen in northern drift in Russia. This drift is older than the basalt which covers it near the Columbia River. Nothing like it is known further south on the Pacific coast.

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It seems to be recorded that these old ice marks, and this marine northern drift about the latitude of Devonshire, on the Pacific coast, are older than the volcanic coast range, which is said to be of cretaceous age, and as old as the Rocky Mountains. But this drift, which is older than cretaceous times, and the only record of Polar glaciation that I could find on the Pacific coast in America, or in Japan, coincided with a climate like that which now exists about Puget Sound, and which has existed there during the whole period according to the evidence of fossils buried in the drift and under the basalt. Shells lived in the sea as they do now; trees now grow to the extreme height of 300 feet; trees then grew so abundantly that rafts twelve feet thick gathered and were buried under gravel and sand. Then as now a few large stones were dropped from ice amongst the sea shells. Later on, floods of basalt buried the forest, charred some of the rafts, and made them brown coal. On the new surface grew new forests, in which life flourished. Elephants' tusks have been found low down in the basalt series. That surface was buried in turn, and new floods flowed over new surfaces, till the Cascade range was piled up 4,000 feet deep, and till cones grew to their full size of 11,000 feet or more. The whole land bulged and rose, mountains and all; the drift on it rose above water, and then land waters, and sea waves, and tides, began to dig Puget Sound out of the drift. I could not see a solid rock in a day's steaming between Tacoma and Victoria. till near Vancouver's Island. In this whole record, which seems to be continuous from cretaceous times, or from the rise of the Rocky Mountains at any rate, there is ro place left for a general Glacial period which extinguishes life.

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Under 4,000 feet of basalt I found fossil trees. Local geologists have found shells, elephants' bones, and a series of fossil records between the leaves of this great stone book in sections cut through it by eroding streams. There has been no Glacial period there. There are no marks of Polar glaciation anywhere near the present limit of northern drift on the Pacific coasts.

The world is a cooling mass. I believe that the present is the coldest period of which there is any geological record, and that Polar glaciation now is, and always has been, marine in low latitudes.<sup>1</sup>

## XXII.—CONCLUSION.

I HAVE now ranged my budget of facts in order. I left home to go round Europe, July 24th, 1873, and turned westwards at Astrakhan, September 17th. I got home after 151 days, on the 22nd of December.

I left home again on the 6th of July, 1874, and passed the meridian of Astrakhan westwards on the 23rd of May. On the 7th of June I got to my old route at Marseilles; on the 9th I got home, after following the setting sun for 337 days. I saw a great deal in these 488 days. I saw nothing to

<sup>&</sup>lt;sup>1</sup> A report by the State Geologist of Oregon was "ordered to be printed" in September, 1874. I hope to read it when it appears. From newspaper reports, I learn that it will show in detail evidence to prove that the basalt of Oregon covered many surfaces in succession, on all of which life abounded.

indicate a general Glacial period along the routes. Half round the world I saw that it never was covered by an ice-cap. Having passed along a whole circle of longitude, and more than a quadrant of latitude in twenty months; having been to perpetual snow in summer, and to tropical heat in winter in mines, I have ceased to believe in a Glacial period, of which I can find no marks on high hills. It may be said that the volcanoes of Oregon, Japan, and Java, have grown since the glacial period. The crystalline gneiss hills of Ceylon are old and hard. There are no glacial marks in Ceylon. But ice there forms new at 6,500 feet above the sea at the foot of Pedro Tulagulla. During a glacial period the limit of freezing must have been lowered everywhere, and glaciers must have grown where it freezes now, and where ten inches of rain now fall in twenty-four hours. After careful search I could see nothing like a glacial mark of any kind, from a firth and rock basin to a scratched pebble, between Victoria in Vancouver's Island, and the highest point in Ceylon. I saw nothing glacial on the way to Marseilles, except snow in Crete and Corsica.

A period of Polar glaciation has begun, and is chiefly marine so far. If the earth goes on cooling, the snow plane may come down even on Adam's Peak, and extinguish his race. A solid ice-cap may yet cover the land, and fill the bed of the sea, and grow till it shuts up the world. But I have found no record of any such past event. The secular cooling of the earth is a manifest fact recorded everywhere, and makes that improbable which is recorded nowhere that I have been.

My conclusion as to Polar glaciation is, that the present is

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e printed" newspaper e basalt of ounded. the period of Polar glaciation and the "Glacial period," and the coldest period that the world has felt since it was a fused drop, cooling in space, subject to physical laws which govern the solar system, and the materials of which it is made.

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# XXIII.-A GEOLOGICAL GLOBE.

Jan. 28th, 1875.—I have vainly sought for a published geological globe, with or without relief, which I have often missed. I have therefore tried to depict that which I have tried to describe. I have painted a 12-inch globe, to show the position of glaciers and drifting sea ice, and of northern glacial drift, so far as I have learned that kind of superficial geology from books, maps, and observation. I have painted the side of the brazen meridian white, from the Pole to 60° N., the limit of glaciers which now enter the sea in Greenland and North America. To 37° N. I have dotted the quadrant within the limit of Atlantic drift. On the edge I have marked a white patch at 36° N., for small American and Asian glaciers which exist at 8,000 or 10,000 feet above the sea. I have put a larger patch between 27° and 28° N., for an Asian glacier of larger size, which ends about 13,000 feet above the tide. Taking all that together, and given like meteorological and other conditions, scattered marks of old glacial action probably register scattered local climates, like those which exist locally north of 27°.

By turning the globe, spots on it pass under these painted glacial marks. The band between 27° and 28° N. passes

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over the hottest region in the world, which is in Arabia, and over large glaciers in the Himalayas.

If the world were fluid, a section at 40° or 50° would be as circular as the surface of the sea is in a calm. That fluid surface rises and falls with the tidal wave, with earthquake waves, and with the ocean swell. Where it is frozen the crust moves also. Between 40° and 50° the solid surface on which the sea rests is not circular. By turning the globe eastwards, I follow my westward track. From the bottom of the Caspian Sea the surface goes up over plains and over the Caucasus, and over small glaciers, ending at 7,374 feet, below a cone 16,000 feet high. The surface goes down to the bottom of the Black Sea, and the volcanic hollow of the Greek Archipelago. It goes up over Greece to snows, down into the Adriatic, up over the Appennines and Alps and Swiss glaciers; down into the Mediterranean hollow, up to summer snows in Corsica, down again to Mediterranean depths, up over snows in the Pyrenees, and over the sunny plains of France and Spain. Then it goes down to the depths of the Atlantic, where water is cold; to rise over America, sink under the Pacific, to cold water; and rise over Asia into cold The worn surface of a band ten degrees wide is like a rough sea on the back of a tidal wave. The crests of the waves rise into a glacial period. Neglecting short steep dips and rises, volcanic cones, isolated mountains, and mountain chains; and all faults and marks of wearing; the crest of one solid earth-wave is somewhere about the desert of Gobi in Asia; and the crest of another is nearly opposite to it somewhere about the middle of North America. The troughs of these two land-waves are opposite to each other, beneath

the Atlantic and the Pacific. The height of the highest points and deepest depths above and below fluid tides, so far as known to me is, roughly, five miles each way—say ten miles, or one-sixth of a degree; or about one-sixtieth part of an inch on a twelve-inch globe, where a degree is about a tenth of an inch long.

A coat of varnish would represent the whole difference on a physical globe made in relief to scale. The solid surface is not at rest. I have felt it move. It is constantly moving, and it has been moving from the earliest times yet determined by geologists according to facts, "which cannot be unfacted," as a baby philosopher lately said, to clinch her argument. The crests of the American and Asian land-waves have both been under the sea. Fossils are near Kashgar and Salt Lake to prove it. "Stubborn geological facts," as Mr. Evans, President of the Geological Society, called them, which cannot be "unfacted."

The troughs may have been crests. The shape of the seabottom is like that of dry land; the dry crests may be troughs again. When I consider my collection of mental geological sections sketched between 40° and 50° N. and near the line during the last three years, while looking at my painted globe, I find a general tendency to a meridian strike in the larger folds of sedimentary altered rocks. I find most folds and faults and igneous rocks in the lowest and oldest of the geological series. I think that I have seen a general tendency to folding caused by forces acting from E.W. amidst minor folds and wrinkles as numerous and as various in size and direction as waves and ripples are on tidal waves in the wide ocean.

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eas wh ing I have given my opinion on one branch of superficial geology which I have studied. Subterranean geology must be matter of induction. My induction from facts known to me is this: I suppose that the globe still is fluid, under a crust which has been growing thicker below while the cooling surface above has been worn and mended to an amount equal to the sum of all sedimentary rocks; from those now forming back to Laurentian times, or possibly much further back in time.

I find experimentally that cold water may rest on a thin layer of clay—or of any non-conducting substance within a short distance of water boiling under the clay—on iron, or on any good conductor artificially heated.

I suppose that the forces which raise daily tides in the sea, whether it be tropical or Arctic; heated or crusted with ice; also raised denser fluids, and their crust of solidified igneous rocks. When that crust was thinner, I suppose that the outer world was warmer; I suppose that the surface was more easily moved and cooled and shrunk faster and was more easily folded, e.g. while coal was growing. I suppose that the same forces which now raise tides under sea ice raised them in the fluid which was uppermost, and moved the crust whatever it may have been made of. I suppose that the same forces still move a thicker crust, very slowly and gradually, by a continually recurring daily strain always repeated in the same western direction, as meridians pass eastwards under the sun and moon. They raise tidal waves which follow them westwards like hands on a clock, according to Newton and Laplace, and those who publish maps and books on tides. According to this supposition, the western

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coasts of the old and new worlds may be rising in front of slowly-advancing land-waves whose crusts are continents and whose troughs hold the sea. Eastern sea coasts may be slowly sinking, behind these waves. I suspect that they are, I do not yet know enough of these facts to be able even to form an opinion. I know that great part of the western coast of Europe has risen, and that part of it is slowly rising. I know nothing about the coast of Africa, but the Sahara has risen from the sea. I know that some parts of the opposite eastern American coasts are sinking, and that the sea has encroached on the land. At other places the eastern coast of America is said to be rising. Part of the western American Pacific coasts have risen and have been seen to rise; possibly Asia was bounded on the east by the deep Pacific region, and has sunk enough to let the sea cover a wide fringe of shallows; which are inside of Kamtchatka, Japan, the Philippines, and Borneo. Certainly many parts of these regions have been up and down many times. Possibly the rise and fall of land may be found to obey a law which may be explained like the law of the tides, and may be as regular. I do not know, but "I want to know."

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"There is a region in which geology passes into cosmogony." To that region the late and reigning chiefs of the Geological Society, to which I have the honour to belong, pointed. "There I left them," as the old men in the mountains are wont to say when they cease telling an endless story. There I find my learned friends when I return to school from my holiday, with this my holiday task. I have more than once ventured out of soundings on a voyage of discovery all alone, to return convinced that we have a great

deal to learn, so let us go ahead and pull together, acknowledge errors, confess ignorance, try to learn and add all we know to the common stock.<sup>1</sup>

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# XXXIV.—AN EARTHQUAKE.3

To show what an earthquake has done, I add an account of the wreck of a Russian frigate on the coast of Japan in 1854. Some years ago the sea rose at Kobe in the south of Japan. On the opposite side of the Pacific, in South America, a like event happened. It was described in the English newspapers. Such waves any account for marks near the Pacific coasts, which are like raised sea margins. In any case, this disturbance of the earth's crust was a fact.

The earthquake which wrecked the *Diana* was a most signal catastrophe; but, as no Europeans were present save the *Diana's* crew, and as they were scattered immediately afterwards, no account ever reached Europe about it. Many other details Kovalevski gave me, for he became in India an especial chum of mine; but the inclosed is simply his translation of his log, and of course is not in very good English.

The Russians behaved heroically, and built themselves a

<sup>2</sup> Description sent by the Rev. Mr. Fothergill, written by his brother.

<sup>&</sup>lt;sup>1</sup> December 1, 1875. In confirmation of some of my writings in Frost and Fire (1862 and 1875), I wish to refer to a great work by well-known authors—The Moon considered as a Planet, a World, and α Satellite, by James Nasmyth, C.E., and James Carpenter, F.R.A.S. (John Murray, Albemarle Street, London, 1874.) In reading that work, the secular cooling of the earth, and the consequent crushing and crumpling of the surface which is proved in the latest American Geological Report for 1874 to be a fact, seems to be explained reasonably. The whole solar system must be considered henceforth by geologists who treat their science broadly. So treated, a glacial period seems to me improbable and unproved.

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schooner ashore, in which the admiral, captain, chief officers, and the main of the men, escaped either to Petropaulski or up the river Amoor, we never knew which, but Kovalevski told me that they reached St. Petersburg by droskies overland all safe.

Just before the vessel was abandoned, the money chest was brought on the quarter deck, and each officer took whatever sum he chose, which was put down by the captain againhis future pay.

Out of five officers we had on board, four spoke English perfectly. They were perfect gentlemen, used to play at whist, and go to balls at Hong Kong and Madras, shot in Ceylon, &c.; for the two were on board of us f. more than six months, and we all parted with much regret on the proceed after the Crimea. They went by schooner to Amoor, and across country to St. Petersburg.

Translated Extract, word for word, from the Log of Lieutenant Kovaleeski, of late Russian frigate "Diana," wrecked in Simoda Bay, Japan, on the 23rd December, 1854.

About 200 men and eight officers were captured by H.M.S. Styr, endeavouring to escape to Petropaulski, in Kamtchatka. Ninety-three seamen and five officers were transferred to H.M.S. Nankin, 50. Subsequently only two were left—Lieutenants Kovalevski and Prince Mehealoff the former a grandson of General Kovalevski, who commanded a brigade in the Crimea, from whom the appended account was given to Percival A. Fothergill, N.L. of H.M.S. Nankin.

On the 23rd December, 1854, 6 and, the frigate wished to shift berth, and sent a boat to less out a small anchor on the

bow of ship; at 9.15 boat returned; at 9.30 another anchor was sent from stern; 9.45, whilst laying out the second anchor, felt the frigate shake very much, and for about one minute. The admiral shifts the ship again; but, on sounding, we find eight fathoms. We all think it was an earthquake. The water was calm, and the sky clear, so we begin to think it was nothing, and began again to shift the ship.

10 A.M.—A large wave was seen coming rolling in the bay. and the water rise very rapidly on the land, immersing the village of Simoda, so that we thought the land was sinking. A large Japanese junk was driven on shore with violence; but the frigate held to her anchors. One cutter and captain's gig on shore repairing we see going out to sea, and we send a boat to fetch them; but in five minutes we observe the water very muddy, going rapidly out of bay. We lashed our guns fast, closed the ports, and secure and batten down everything. During this the large boat that was sent to lay out the anchor was recalled. Having let go the cable, we had only time to hoist up one boat; but all the men got on board. The other boats were washed on shore. At this time a large wave rolled into the bay, and, on its receding, all the houses in the village were washed out with it, quite filling the bay with houses and junks, and the frigate began to drag.

10.15 a.m.—Let go second bower anchor; but this anchor had not time to bring up before a third wave came rolling into the bay; and this wave, on receding, left not a single house in the village; the only building which was left standing was a temple in process of building. A stream of

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hed to on the smoke is seen on side of hill, but we could not observe where it came from, and a strong smell of sulphur in the air. The water then advances and returns so quickly that a regular whirlpool is made in bay, and all the Japanese junks and our frigate begin to rotate so quick that we all become giddy. The frigate only describes three-quarters of circle. The leadsman report the frigate (report the) dragging, but we did not let go the third anchor, knowing there would be time before we went on shore.

10.30 A.M.—A large junk come with great force on our starboard bow, and carried away flying jib-boom, jib-boom, martingale, whiskers, and swinging booms, leaving only bowsprit, with the bows much injured. Two men from junk managed to scramble on board, but the other five would not come though asked, and immediately she went down. Whilst the frigate was turning, the small island was only three cable's lengths from us, and the nearest island only half a cable, and during half an hour the frigate made from sixty to seventy turns, during which we were nearer than half a cable to the island.

10.45 A.M.—Let go third anchor. We were so near to island that bowsprit was only five feet from island; so that a few times we took off our caps (Russians do when going into the presence of God), and were ready for death, but God was merciful. We can do nothing with frigate, for the water turn her at pleasure; and at one time we were so near, the ship fell on her beam ends, burying half her main-yard across her gunwale in water, and so much we could not stand on deck, very likely having touched some small rock, but we could not tell, the motion was so rapid. Frigate was in this position about five minutes, and on water rising a little ship

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tit 25 righted and slid off, but before she was properly righted she described three-quarters of a circle two or three times. On falling from the rock, we lost our rudder, half our stern-post and false keel, piece of keel eighty-one feet long, and two planks. In these five minutes the water rose from six feet to twenty-three. One of the guns amidships broke adrift, and jumped across two guns on the opposite side, and injured five men—one killed, one lose his leg, another three ribs broken, another neck cut, another lose finger. When frigate righted we find thirty inches water in hold; all pumps were worked.

12 NOON.—Ebb and flow begin to be less violent. We put out shores on each side—on starboard side, spanker boom, stunsail booms, &c.; on port side, main and mizen topmasts, &c. Twenty-five inches water in hold.

12.15 P.M.—Finished making shores.

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12.30 P.M.—Water came with same force, making whirlpool in bay and turning frigate; this continued from

1.30 to 2.30 P.M.—No large wave came into bay, but the tide rose and fell very quickly, from, in five minutes, twenty-three feet to two feet, and one time we saw all our anchors come up from the bottom. During this time the frigate was on her beam ends four times; carried away all shores.

3 P.M.—Everything was still, and frigate was in twenty-two feet of water, and making twenty-two inches every hour. Round the ship and covering the bay were the wreeks of junks and houses; from the top of one of these houses we take an old woman, quite insensible; during all this time the day was the finest we had had, and wind very light from N.E.; from first shock to finish of the earthquake the barometer was 29.87 Ther. (Fabrenheit) 57.78.

3.30 P.M.—We begin to clear our anchors, and with the starboard anchor came beam, which we took on board; during this work the surgeon went on shore to assist the Japanese; these last say that about 300 had been drowned. All hands slept that night in their clothes.

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24th December, 1854.—We begin early to clear our anchor; on heaving up port anchor, ship began to drag, and we let go anchor in the waist, and we find that both bower anchors come up together, and with them several Japanese anchors, clothes, one large net, &c., &c., &c. In the evening the anchors were cleared.

25th December. 1854.—Send the boat to find rudder and keel; the keel was found about half a mile inland, with admiral's barge, bottom up, but not the rudder. After dinner all officers go ashore, and we could not tell where houses and streets had been. On our return, when stepping into boat, in one moment water left her; we were going to launch her, but before the men could get out of the boat, the water returned and the boat got on board the frigate. The bells were rung on shore to warn the people, and on board we laid out a kedge to haul the frigate into deep water.

9 P.M.—The frigate begin to turn, but not so strongly as at first day, but there was only one fathom of water. Out of 1,000 houses only thirty remained, and the former site of the town is now strewed with wrecks of junks. Two miles inland a large junk was seen, and several large landslips. We remained at Simoda till the 12th of January. Then, not finding a convenient place to heave her down, we tried to tow her round to Lortomie, about thirty miles from Simoda. Before that we had made a new temporary rudder; when we

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started the wind was fresh from N.E., but ship would not steer, driving fast on shore; we therefore let go the anchor: this was about 9 A.M. After dinner we tried again to sail out, but were obliged again to anchor.

14th January, 1855.—Wind not so fresh. All her guns were brought aft, and on weighing the ship went before the wind, but on attempting to enter the Bay of Lortomie, we had to tack, and would have anchored, but could find no bottom, although we were within the bay. So we wished to cruise all night.

6.30 P.M.—Wind came S.W., but not knowing the place, it was not thought advisable to enter before daylight; the wind was very strong, and, when near the shore, the ship would not wear or stay. The ropes which held the temporary rudder gave way; we then hove to and put the rudder through the admiral's cabin. The ship during all this was driving up the bay, and when the rudder was finished it had no command over the ship. We then furled all the sails to allow her to drive up, but though very near the land there was no bottom. The leadsman at last sings out nine fathoms, and the anchors were immediately let go; we were then about twenty fathoms from shore; all the yards and topmasts were sent down: this was finished about 3 P.M.

15th January, 1855.—The pumps could not keep the water from increasing. After dinner a consultation was held, and they forsake the frigute.

6 P.M.—A boat was sent ashore with a rope; there was a great surf on the beach, but the rope was made fast to the shore.

16th January, 1855.—Hoisted up fore and main yards to vol. II.

hoist the boats out. The sick were first on shore in the barge. The other men were hauled through the surf. Several casks were thrown overboard, but did not drive ashore.

6 P.M.—All men were ashore except admiral, captain, and first lieutenant. Captain left the last.

17th January, 1855.—There was six feet of water on lower deck; it was attempted to take something out of her, but very little could be saved.

18th January, 1855.—Japanese sent 300 boats to tow the frigate up the bay. Admiral, captain, and some other officers with twenty men went on board to let go the cable, gave the tow rope to the boats and leave; the whole of the white streak was under water. The boats towed the frigate about three-and-a-half miles; the wind increased from the S.W., and the boats left the frigate and made the best of their way on shore; in about twenty minutes frigate gave a lurch to port, righted for a moment, and then sank.

# XXXV.-OPINIONS.

Pages 213 to 322. Upon facts learned I have formed opinions which may be all wrong. "No sabe."

1st. I have not found marks of a "period" colder than the present, and wait for evidence to prove that "a general Glacial period" ever existed.

2nd. The circulation of gases and fluids, of air and water, upon this globe, evaporation condensation and consequent erosion, are caused and regulated by unequal temperature, by

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radiation, and by the earth's rotation. I think I know so much.

3rd. That circulation accounts for cold local climates, like those of Iceland, and Greenland, and Labrador, and the antarctic regions; and for ancient local climates like these, which are recorded by glacial marks in like latitudes, in Russia, in Finland, in Scandinavia, in the British Isles, in North America, and elsewhere on the world's surface. That is my opinion.

4th. Movements at the earth's solid surface, observed and recorded by fossils, &c., account for the recorded displacement of the sea, with its hot and cold currents, and their climates—cold and warm, wet and dry.

5th. These movements, which still continue, and the ascertained crushing and folding of concentric shells of sedimentary beds of rock, result from the cooling and shrinking of the earth's mass, which still is hot beneath the surface; which still is fused beneath active volcanoes; and which may still be a fluid mass shrinking within a solid crust. So I suppose.

6th. I suspect that these movements may be regular on the large scale, and may result from the same mechanical laws which move tides under ice. I do not know enough to form an opinion.

7th. I have learned to face my own ignorance, and to hold opinions on all such matters provisionally. The longer I live and learn the more I feel how much there is that may be learned: "how little it is we do know," and how vast is that knowledge which is beyond human reach.

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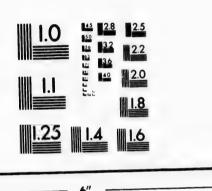
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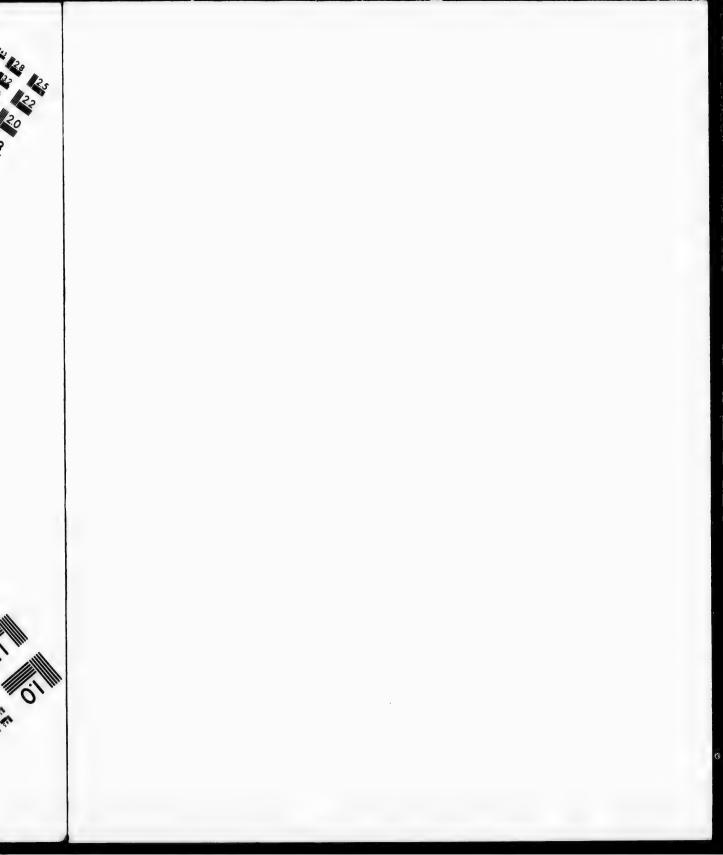
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